PROGRAMME

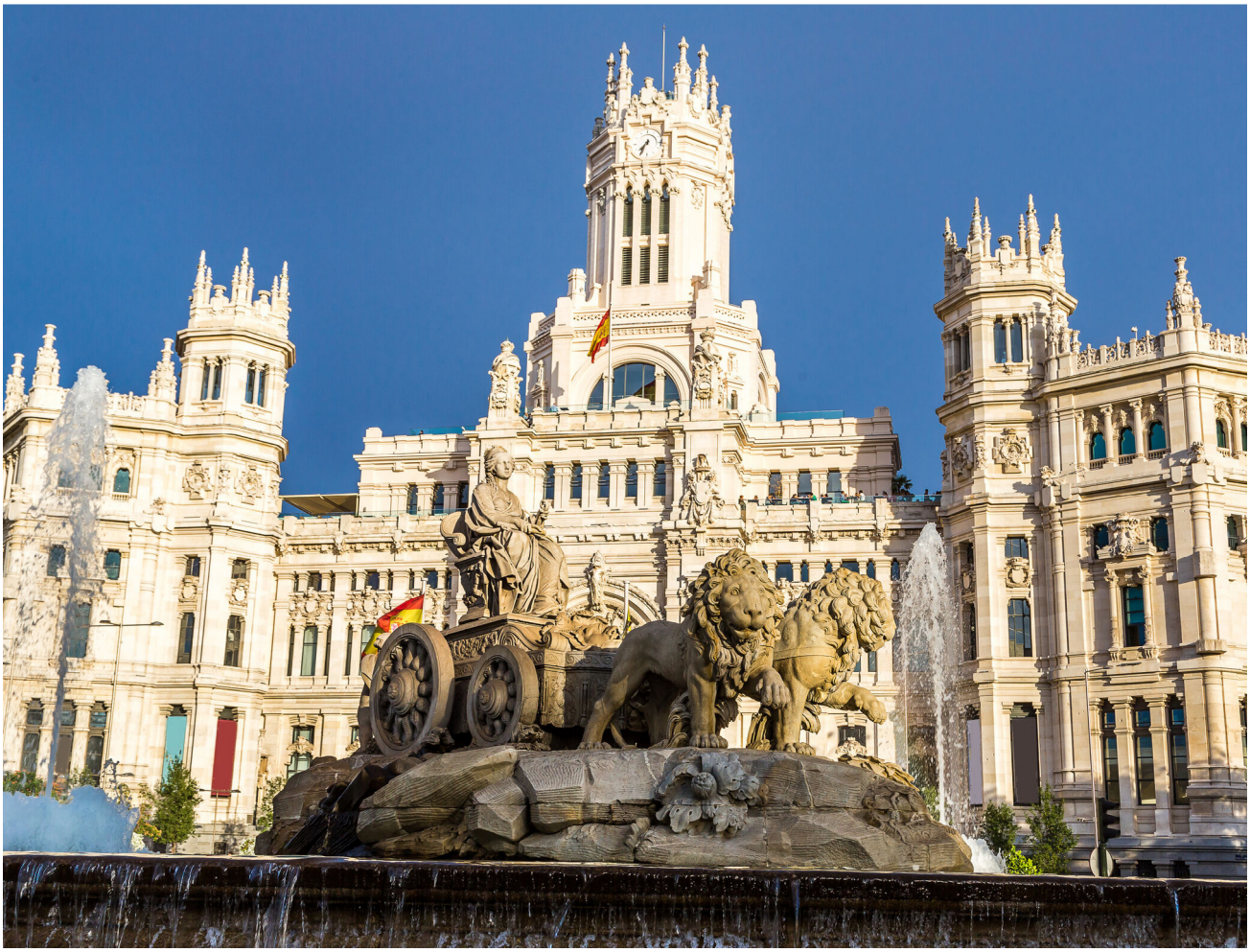
7th

INTERNATIONAL CONGRESS OF THE EUROPEAN MILK BANK ASSOCIATION (EMBA)

Human Milk Banks:
Equity and Quality for the Health of Vulnerable Babies

MADRID
25-27 October 2023

12 Octubre University Hospital, Madrid



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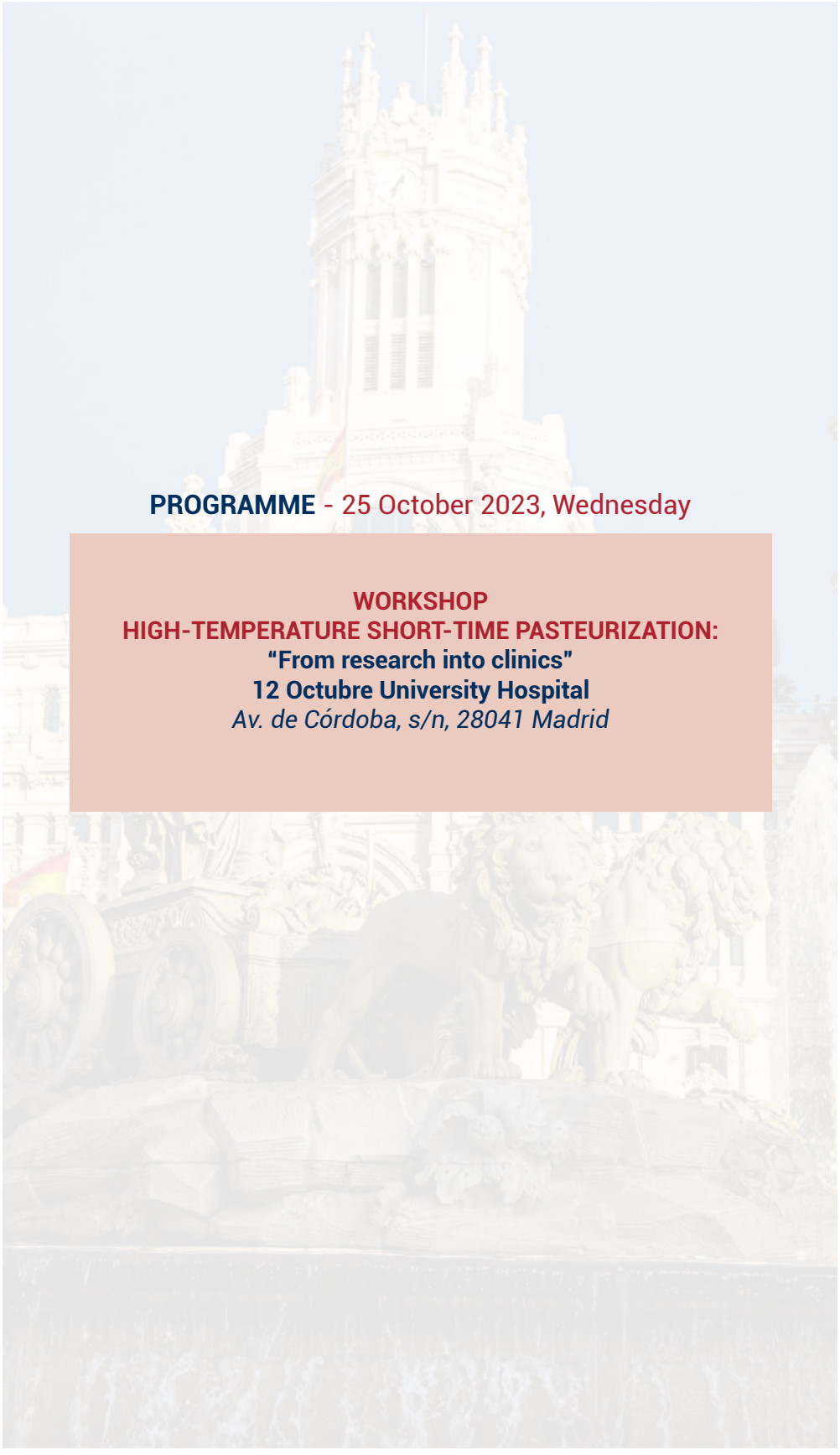

PROGRAMME - 25 October 2023, Wednesday

WORKSHOP
HIGH-TEMPERATURE SHORT-TIME PASTEURIZATION:
"From research into clinics"
12 Octubre University Hospital
Av. de Córdoba, s/n, 28041 Madrid

08:30-09:00 **Welcome**

09:00-09:20 **OPENING LECTURE**

Human milk banks in Europe: Past, present and the future
Sertac Arslanoglu, EMBA President

09:20-11:40 **SESSION I**
HUMAN MILK TO ENSURE THE EQUITY FOR THE HEALTH OF VULNERABLE BABIES

09:20-10:40 **Breastfeeding and Milk Banking**
Moderators: Nadia Garcia, Guido Moro
(20 minutes for each presentation)

Trends in Spanish breastfeeding and milk banking
Aguilar Hernandez Maite, Spain

Breastfeeding and milk banking in Brazil
Joao Aprigio, Brazil

Availability of donor human milk and NICU morbidities
Jean-Charles Picaud, France

Discussion (20 minutes)

10:40-11:10 Coffee Break

11:10-12.30 **NEW CHALLENGES WORLDWIDE**
Moderators: Corinna Gebauer, Jean-Charles Picaud
(20 minutes for each presentation)

How to protect breastfeeding and milk donation during emergencies and disasters
Guido Moro, Italy

Efforts and challenge of providing donor milk in special circumstances
Alexandra Wesolowska, Poland

Integration of human milk banks service in the emergency system during natural disasters: The experience of Philippines
Estrella J. Olonan-Jusi, Philippines

Discussion (20 minutes)

12:30-13:00 **ORAL COMMUNICATIONS SESSION I (OC1-3)**
Moderator: María José Gormaz Moreno
(7 minutes presentation + 3 minutes discussion)

OC 01 **Got (Optimal Milk)? Pooling Donations in Human Milk Banks with Machine Learning and Optimization**
Wong Rachel, Mahmood Rafid, Zhu Ian, O'Connor Deborah, Stone Debbie, Unger Sharon, Chan Timothy

OC 02 **Global Study to Characterize Nutrients in Donor Human Milk: Preliminary Findings on Macronutrients, Metabolizable Energy, and B-Vitamins**
Perrin Maryanne, Mansen Kimberly, Israel-Ballard Kiersten, Bode Lars, Cofré Maggio Francisca, Njuguna Emily, Tran Hoang, Wesolowska Aleksandra

OC 03 **Can a human milk bank improve mother's own milk use for very low birth weight infants in NICU?**
The Vicenza experience
Dal Cengio Valentina, Danese Nicoletta, Cecchetto Michela, Cretì Marta, Rizzato Paola, Davide Laura, Cappellari Anna, Bellettato Massimo, Vedovato Stefania

13:00-14:20 **Lunch and Poster Session**

Posters from P 01 – to P 42

14:20-16:00 **SESSION II**
HOT TOPICS IN HUMAN MILK RESEARCH
Moderators: Sertac Arslanoglu, Laura Cavallarin
(20 minutes for each presentation)

The human milk microbiota: a challenge for human milk banks
Juan M. Rodríguez, Spain

Human milk and new viruses
David Lembo, Italy

Impact of the HMO content on the neurodevelopment of preterm infants
Clair-Yves Boquien, France

New human milk fortifiers
Enrico Bertino, Italy

Discussion (20 minutes)

16:00-16:30 **ORAL COMMUNICATIONS SESSION II (OC 4-6)**
Moderator: Antoni Gayà
(7 minutes presentation + 3 minutes discussion)

OC 04 **Application of Nanosecond Pulsed Electric Field (nsPEF) Treatment in Donor Human Milk**
Wang Yiting, Zare Farzan, Ghasemi Negareh, Zare Firuz, Shaw P Nicholas, Bansal Nidhi

OC 05 **The microbiome of donor human milk: a multi-center study. Artificial intelligence identifies multiple associations between microbial composition, diversity, milk composition, and maternal diet**
Leigh Robert J, Mahon Bernard P, Olędzka Gabriela, Bertino Enrico, Bzikowska-Jura Agnieszka, Drążkowska Izabela, Gandino Serena, Gaweł Paulina, Gawrońska Małgorzata, Mołas Aleksandra, O'Shea Shauna, Sottemano Stefano, Sinkiewicz-Darol Elena, Tonetto Paola, van den Akker Chris H P, van Goudoever Johannes B., Walsh Fiona, Wesolowska Aleksandra

OC 06 **Developing Methodologies to Improve Recovery and Profiling of Microorganisms from Donor Human Milk**
Li Ranran, Megaw Julianne, Cameron Simon

16:30-17:00 Coffee Break

17:00-18:20 **SESSION III**
LEGISLATION, GUIDELINES AND CULTURE OF DONATION
Moderators: Enrico Bertino, Daniel Klotz
(20 minutes for each presentation)

Legislation at European level
Silke Mader, EFCNI

WHO Guidelines on Human Milk Banking
Kiersten Israel Ballard, PATH

Cultural differences in milk donation
Tanya Cassidy, Ireland

Discussion (20 minutes)

18:20-18:50 **ORAL COMMUNICATIONS SESSION III (OC 7-9)**
Moderator: Carmen Pallás Alonso
(7 minutes presentation + 3 minutes discussion)

OC 07 **Donors' motivations and social factors influencing human milk donation in selected European countries**
Gawronska Malgorzata, Cassidy Tanya, Gandino Serena, Molas Aleksandra, van den Akker Chris H P, Bertino Enrico, Drazkowska Izabela, Gawel Paulina, van Goudoever Johannes B., Sinkiewicz-Darol Elena, Sottemano Stefano, Tonetto Paola, Wesolowska Aleksandra

OC 08 **The course of macronutrient concentrations in human milk during two years of lactation**
Muts Jacqueline, Lukowski Juliette I. A., Twisk Jos W. R., Schoonderwoerd Anne, van Goudoever Johannes B., van Keulen Britt J., van den Akker Chris H.P.

OC 09 **Study Of Stem Cells In Human Milk During Transition Of Lactation**
Mane Shailaja

19:00 **GENERAL ASSEMBLY - EMBA MEMBERS**

08:30-09:30

SESSION IV

IMPROVING THE QUALITY AND DISPENSE OF HUMAN MILK: Results from EMBA Working Groups

Moderators: Clair-Yves Boquien, Serena Gandino
(10 minutes for each presentation)

Processing of donor human milk
Guido E. Moro, Italy

Fortification of donor human milk
Sertac Arslanoglu, Turkiye

Microbiology of donor human milk
Corinna Gebauer, Germany

Indications for the use of donor human milk
Jean-Charles Picaud, France

The impact of maternal diet on donor human milk
Gillian Weaver, UK

Discussion (10 minutes)

09:30-10:00

ORAL COMMUNICATIONS SESSION IV (OC 10-12)

Moderator: Marta Cabrera Lafuente
(7 minutes presentation + 3 minutes discussion)

OC 10

Preserving Nutritional Integrity: Freeze-Drying Donor Human Milk for extended compositional stability at ambient temperatures
Cheema Simran Kaur, Shenker Dr Natalie, Collins Dr Ben, Cameron Dr Simon

OC 11

The Steroid Profile of Human Milk and Pasteurized Donor Human Milk
Ten-Doménech Isabel, Moreno-Giménez Alba, Campos-Berga Laura, Parra-Llorca Anna, Ramón-Beltrán Amparo, Gázquez-Ortega Antonia, Gormaz María, Kuligowski Julia

OC 12

Vegan/vegetarian diet and human milk donation: an EMBA survey across European milk banks
Gandino Serena, Bzikowska-Jura Agnieszka, Karcz Karolina, Cassidy Tanya, Wesolowska Aleksandra, Królak-Olejnik Barbara, Klotz Daniel, Arslanoglu Sertac, Picaud Jean-Charles, Boquien Clair-Yves, Bertino Enrico, Moro Guido E., Weaver G.

10:00-10:30

Coffee Break

10:30-11:10 **ORAL COMMUNICATIONS SESSION V (OC 13-16)**
Moderators: Beatriz Flores Antón, Summer Kelly
(7 minutes presentation + 3 minutes discussion)

OC 13 **Setting up the first human milk bank in Uganda: A success story from St. Francis Hospital Nsambya**
Nakibuuka Victoria, Khainza Janet, Nasiima Ritah, Nalunga Sanyu, Mponye Hamim, Nantenza Racheal, Namugga Babara, Nampijja Joanita, Nazziwa Ritah, Gillian Weaver

OC 14 **Working Group On Drugs And Breast Milk Donation**
Gormaz Moreno Maria, Brugada Montaner Maria, Parra Llorca Anna, Torres Martinez Ester, Garcia Robles Ana María, Marin Gabriel Miguel Angel, Rodríguez Marrodán Belén, Cañadas Garzo Verónica, Paricio Talayero Jose María, Gazquez Ortega Antonia, Ramon Beltran Amparo, Garcia Lara Nadia Raquel

OC 15 **Bridging the Swiss Milk Gap: a one-year review after creating the first human milk bank and blood bank model in Switzerland**
Barin Jacqueline, Henriot Isabelle, Fletgen Richard Carole, Martin Agathe, Touati Jeremy, Prudent Michel, Fischer Fumeaux Céline

OC 16 **Tracking of human milk feeding in the NICU: gaps in clinical practices and possible solutions**
Saenz de Pipaon Miguel

11:10-13:10 **SESSION V**
DIFFERENT OPERATIONAL MODELS OF HUMAN MILK BANKING IN THE WORLD
Moderators: Aleksandra Wesolowska, Anne Grovslien
(15 minutes for each presentation)

Different models to increase the availability of DHM in Europe
Daniel Klotz, Germany

Indian Experience
Sushma Nangia, India

The GAMBA Experience
Gillian Weaver, UK

Human milk banking in North America
Summer Kelly, HMBANA

South Africa experience
Anna Coutsoudis, S. Africa

A different model for milk screening
Sharron Bransburg, Israel

Human milk banking in Iran
M. B. Hosseini, Iran

Discussion (15 minutes)

13:10-14:30 Lunch and Poster Session

Posters from P 43 – to P 82

14:30-15.50 **SESSION VI**
IMPROVING THE QUALITY OF HUMAN MILK
Moderators: Gillian Weaver, Tanya Cassidy
(20 minutes for each presentation)

High-temperature short-time pasteurization: clinical experience and research
Nadia Garcia & Diana Escuder Vieco, Spain

Impact of donors' diet on human milk composition
Kristin Keller & Noelia Ureta Velasco, Spain

How can we improve the environmental health of milk donors?
Nicolás Olea, Spain
Discussion (20 minutes)

Closure

POSTERS – Each presenter should stand in front of the poster panel according to the day and the time of the poster sessions. Size for posters: 100 cm high x 70 cm wide

P 01 – P 42 → 26th October h 13.00-14.20
It is possibile to fix the poster in the morning on 26th October and remove it at the end of the day

P 43 – P 84 → 27th October 13.10 – 14.30
It is possibile to fix the poster in the morning on 27th October and remove it at the end of the congress

MODERATORS
Thursday October 26th

Poster 1 to 14:	**Serena GANDINO**
Poster 15 to 28:	**Aleksandra WESOLOWSKA**
Poster 29 to 42:	**Clair-Yves BOQUIEN**

Friday, October 26th

Poster 43 to 56:	**Sertac ARSLANOGLU**
Poster 57 to 70:	**Jean-Charles PICAUD**
Poster 71 to 84:	**Daniel KLOTZ**

The official language of the Congress will be English.
For Spanish attendees, simultaneous translation from English into Spanish will be provided.

MEETING VENUE
MAIN CONFERENCE HALL
12 Octubre University Hospital
Av. de Córdoba, s/n, 28041 Madrid

ABSTRACT SUBMISSION
The Abstract submission for Poster or Oral Communications must be done, through the Congress web site platform by will be June 30th.
After this deadline the Congress web site platform will be automatically switched off.

REGISTRATION FEES

EMBA Member	€ 120.00
NON EMBA Member	€ 200.00
Student, Volunteer, Unwaged, Low income countries	€ 90.00

The fee includes:
• Access to the two – day sessions
• Congress kit
• Scientific Programme
• Abstract Book
• On line certificate of attendance (available after the end of the Congress)
• Lunch and Coffee Breaks

HOW TO GET REGISTERED
On the Organizing Secretariat website **https://emba.congressonazionale.com**
Once registrations will be over; the online registration form will be replaced by the message: no more registrations available and no waiting list. Online registration is the only possible way to get registered; requests by phone, fax or email will not be accepted.

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CANCELLATION AND REIMBURSEMENTS

For cancellation up to 30 days before the starting of the meeting, we will reimburse 50% of the fee.
No other reimbursements will be made after this deadline. Anyway, it is possible to change the name of the participant until the beginning of the Congress.
In case of cancellation of the event due to reasons not strictly depending on the Organising Secretariat, Biomedia will reimburse the total fee but not expenses the participant has supported to attend the Meeting.

CERTIFICATE OF ATTENDANCE

A certificate of attendance will be available online after the meeting

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ABSTRACTS PRESENTATIONS

HUMAN MILK BANKS IN EUROPE: PAST, PRESENT AND THE FUTURE

Sertac Arslanoglu, MD, Professor of Neonatal Medicine
President, European Milk Bank Association (EMBA)
Scientific Coordinator, Italian Association of Human Milk Banks (AIBLUD)

Mother's own milk (MOM) is the first choice for all neonates, but some tiny preterm and critically ill infants might not have sufficient breast milk supply in the early days of life. When MOM is not available or insufficient, donor human milk (DHM) is the best alternative, as recommended by American Academy of Pediatrics, European Society for Paediatric Gastroenterology Hepatology and Nutrition,and World Health Organization. Although some bioactive milk components are lost to varying degrees with the heat treatment methods widely used by milk banks, many other precious bioactive compounds are completely or partially preserved and are not found in preterm formulas.
Since the establishment of the first HMB in Vienna in 1909, HMBs have been integrated into the national strategies aiming to improve health outcomes particularly for preterm infants. Currently there are 282 active HMBs in 30 countries across Europe.The two recent EMBA surveys showed clearly that (i) there is a wide variability in milk banking practices across Europe (ii) there is a lack of a legislative framework concerning the use of DHM in majority of the European countries and existing few national legislative frameworks differ majorly.
Many of the HMBs in various countries follow strictly the guidelines prepared by the national scientific societies based on the norms mostly on food processing and/or for blood donation. In some countries there are national milk banking associations. The European Milk Bank Association (EMBA), which was officially launched in 2010, acts on a continent base hosting 282 HMBs in 30 European member countries, and recently EMBA policy and recommendations have become a reference also for non-European countries. There are no worldwide milk banking guidelines, and there is no uniformity within the national ones. Yet, EMBA has recently published consensus recommendations for the establishment and operation of milk banks. In July 2022, the European Commission (EC) adopted the proposal for a Regulation on standards of quality and safety for Substances of Human Origin (SoHO) intended for human application. Human milk, for the first time, was included in SoHO definition to be regulated. EMBA has been involved as one of the main stakeholders and has intervened at certain stages.
There is still room for improvement in optimization of the screening, milk handling, banking procedures, operational models and milk fortification to obtain a product with the optimal safety and quality. EMBA Working Groups and researchers/experts in the field of milk banking are working on these topics and some promising results will be presented in this Congress.

SELECTED REFERENCES

1. Arslanoglu S, Moro GE. Quality standards for human milk banks. World Rev Nutr Diet. 2021;122:248–264.
2. Meek JY, Noble L; AAP Section on Breastfeeding. Policy statement: breastfeeding and the use of human milk. Pediatrics 2022; 150(1):e2022057988.
3. Arslanoglu S, Corpeleijn W, Moro G et al.; ESPGHAN Committee on Nutrition. Donor human milk for preterm infants: current evidence and research directions. J Pediatr Gastroenterol Nutr. 2013;57:535–542
4. Arslanoglu S, Moro GE, Tonetto P, et al. Recommendations for the establishment and operation of a donor human milk bank. Nutr Rev. 2023 Mar 9;81(Suppl 1):1-28.
5. Weaver G, Bertino E, Gebauer C, et al. Recommendations for the establishment and operation of human milk banks in Europe: a consensus statement from the European Milk Bank Association (EMBA). Front Pediatr. 2019;7:53.
6. Kontopodi E, Arslanoglu S, Wesolowska A, et al. Donor milk banking: Improving the future". A survey on the operation of the European donor human milk banks. PLoS One. 2021 Aug 19;16(8):e0256435.
7. Klotz D, Wesołowska A, Bertino E, et al. The legislative framework of donor human milk and human milk banking in Europe. Matern Child Nutr. 2022 Apr;18(2):e13310.

BREASTFEEDING, DONATED HUMAN MILK AND HUMAN MILK BANKS. THE SITUATION IN SPAIN

Maria-Teresa Hernández-Aguilar, Vanessa Pleguezuelos Hernández Nadia-Raquel García-Lara

Breastfeeding (BF) reported rates in Spain (2017) are collected through the National Health Survey. Slight improvements are reported from 2012 to 2017 (latest data): Exclusive breastfeeding (EBF) at 6 weeks: 66.16 (2012) vs 73.9% (2017), and any BF: 72.37 % (2012) vs 81.09% BF (2017). At 6 months rates were EBF: 28.53 % (2012) vs 39% (2017) and any BF: 46.95% (2012) vs 58.40% (2017) (1). No other indicators are available nationally. The World Breastfeeding Trends initiative (WBTi) report for Spain, highlights the need for better breastfeeding policies (2). Without a national breastfeeding policy and authority supporting breastfeeding, implementing the BFHI, and defending the Code are hindered, leaving mothers and families inadequately protected. This lack of support has its payoffs. Annual losses of 164 to 197 million € (3,4) in avoidable health care costs in Spain, are described related to excess disease in infants fed commercial formulas. Excess health cost attributed to avoidable cases of necrotizing enterocolitis among preterm infants fed with infant formula could amount to 689,446 € annually (4). Donated Human milk (DHM) and Human Milk Banks (HMB) contribute to ameliorate this problem.
Only DHM is accepted in HMBs in Spain. No payment for donors, no charge for recipients. The first HMB opened in Mallorca in 2001, within a blood and tissue bank (BTB). Six years later, in 2007, the first Spanish HMB linked to a neonatal unit opened in Madrid in Hospital "12 de Octubre". Nowadays, in 2023, a total of 17 HMBs serve 73 NICUs in 14 out of 17 Autonomous Regions. The Spanish Association of Milk Banks (AEBLH), founded in 2008, is a non-profit organization that promotes HM donation and HMBs creation. Collected indicators show major increases in the number of donors since 2009, and in the amount of DHM (from 745 L in 2009 to 12,299 L in 2022), and recipients (from 258 in 2009 to 3,241 in 2020). Three different organizational models coexist. Eight HMBs are integrated in a neonatal unit, four are part of a BTB and five use a mixed model where the NICU cares for donors and the DHM is processed and distributed by the BTB. A few HMBs serve only their NICU in-patients but, the vast majority offer wider regional coverage. More information to be found at www.aeblh.org.

REFERENCES:

1. INE [Internet]. [cited 2021 Apr 5]. Tipo de lactancia según sexo y país de nacimiento. Población de 6 meses a 4 años. Available from: https://www.ine.es/jaxi/Tabla.htm?path=/t15/p419/a2011/p06/l0/&file=06154.px&L=0
2. SPAIN's Assessments of the State of Global Strategy for Infant and Young Child Feeding For World Breastfeeding Trends Initiative (WBTi) [Internet]. [cited 2021 Apr 5]. Available from: https://www.worldbreastfeedingtrends.org/
3. Santacruz-Salas E, Aranda-Reneo I, Hidalgo-Vega Á, Blanco-Rodriguez JM, Segura-Fragoso A. The Economic Influence of Breastfeeding on the Health Cost of Newborns. J Hum Lact. 2019 May 1;35(2):340–8.
4. Quesada JA, Méndez I, Martín-Gil R. The economic benefits of increasing breastfeeding rates in Spain. Int Breastfeed J. 2020 May 4;15(1):34.

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BREASTFEEDING AND MILK BANKING IN BRAZIL: 30 YEARS OF PUBLIC POLICY IN DEFENSE OF PREMATURE BABIES

João Aprigio Guerra de Almeida
Rio de Janeiro, Brazil

The Brazilian Network of Human Milk Banks – HMBN-BR, as an institutional initiative of the Oswaldo Cruz Foundation - Fiocruz / Ministry of Health, coordinates the largest conglomerate of Human Milk Banks worldwide. It is a strategic action of the Unified Health System in Brazil, which was initiated in 1985 and since then, operates a successful articulation between public health policy, inter-institutional integration and meeting society's demands for improving the quality of life. This process is irreversible and stems from strategic planning that provides sustainability to the programmed actions. With this perspective in mind, structuring solutions were built that made it possible to adapt the financial matrix to the capacity to respond with quality to the demands of children's health at the local level and to the commitments assumed by the country in the context of global health. This work, historic and of permanent construction, was recognized by the World Health Organization at different times, when it distinguished HMBN-BR with the Sasakawa Health Prize in 2001; with the Global Health Challenges and Responses of the South in Time of Crisis in 2009; and, with the Doctor Lee Jong-wook of Health Prize in -2020. In Brazil, the HMBN management system was implemented 23 years ago and from 2000 to 2022 it is possible to account for: Assistance to 37,717,921 women with breastfeeding difficulties; 3,031,637 donors; 3,504,381 newborns benefited from human milk and 3,432,709 liters of milk collected. Within the scope of international cooperation in Human Milk Banks, with the support of the Brazilian Cooperation Agency/Ministry of Foreign Affairs, the Executive Secretariat of rBLH hosts the coordination of the Networks - Ibero-American, Global and the Summit of Portuguese Language Countries - initiatives that reach all countries in Latin America, the Caribbean and Africa. The association at the international level is structured in an objective and horizontal manner to enable the transfer of the principles that underlie the Human Milk Bank action, adjusting them to the different realities and geopolitical peculiarities. Horizontal relations, always guided by the balance of interests, with the perspective of generating processes that culminate in national qualification to promote the technical and scientific autonomy of cooperating countries, are hallmarks of Brazilian international cooperation in the Human Milk Bank.

HOW TO PROTECT BREASTFEEDING AND MILK DONATION DURING EMERGENCIES AND DISASTERS

Guido E. Moro
Italian Association of Human Milk Banks (Associazione Italiana Banche del Latte Umano Donato = AIBLUD), Milan, Italy

Every year hundreds of thousands of people are affected by natural or humanitarian disasters around the world. The cause of disasters, and the related state of emergency, can be natural (earthquakes, floods, hurricanes, droughts, epidemics) or human-caused (wars, migrations, nuclear disasters).
In emergencies, child deaths can be up to 70 times higher than the average rate. During emergencies and disasters, infants survival can depend on their access to breastfeeding and/or human milk. Wet nursing and donor human milk are recognized options for feeding infants and young children in emergencies situations.
Among natural disasters, earthquakes represent one of the most lethal in terms of human and economic losses. Between 2000 and 2017, 34 earthquakes occurred in Europe. Italy has suffered the greatest losses. Between 2002 and 2016, four severe seismic events occurred producing a total of 679 deaths and 124,000 injured people.
Italy, due to its particular geodynamic context, is characterized by a high seismic hazard (37.6% of Italian municipalities fall in the two higher classes of earthquake hazard).
The Italian Association of Human Milk Banks (AIBLUD) is developing a project that will potentiate the activity of Human Milk Banks in Italy and the distribution of donated Human Milk during natural disaster in this country.
Relevant regulatory frameworks for donor human milk are fragmented and inconsistent, if not entirely absent with few exceptions. A new policy, based on promotion and support of human milk as strategy for emergencies, should be developed in every civilized country.

EFFORDS AND CHALLENGE OF PROVIDING DONOR MILK IN SPECIAL CIRCUMSTANCES

Alexandra Wesolowska
Poland

Special circumstances like disasters, wars and epidemics pose challenges to the maternal and child care system which includes milk banks. Breastfeeding remains the most appropriate way to feed in emergency situations, but under these conditions it is sometimes difficult or impossible by separation mothers and child. Therefore, other option of human milk provision such donor milk is very wanted. However, using the services of milk banks as one of the crisis procedures was included into Operational Guidelines of the Infant and Young Child Feeding in Emergency (OG-IFE 5.11-5.15) in which they appear also the conditions necessary for the implementation of these practices.
There are listed below:

- Inclusion provision donor milk in the crisis management plan or - in the case of the absence of such- an agreement between the relevant entities on the use of donor milk in emergencies
- the ability to assess the demand for donor milk and, on this basis, define the eligibility criteria of beneficiaries, taking into account the duration of the use.
- ensuring high-quality services, including screening, donors and pasteurization of milk in a milk bank, establishing and maintaining a cold chain in order milk safety.

So far, little attention has been paid to preparation milk banks in the event of a crisis.

This applies to not only Poland, but also other European countries. The situation has changed after the global COVID-19 pandemic that has had huge impact on all sectors of health care, with particular emphasis on maternal and child care. Main problem
it was difficult to contact the facility and suspension of transport milk from donors' to hospital. Survey study among milk banks in Italy confirmed a smaller number of donors in 2021 and decreasing volumes of milk donated to the bank compared to previous years (2019). Interestingly, a similar study in milk bank from HABANA reaved that during the lockdown about 65% more milk was donated than before the pandemic. To analyze the preparedness of milk banks in Poland to emergency the questionnaire was done during the pandemic and refugee crisis in 2020 and 2022 respectively.
The resources and potential of human milk banks in Poland have not been used during past crises but the lessons learned forced to development IYCF-E and strengthened national human milk bank network.

INTEGRATION OF HUMAN MILK BANKS SERVICE IN THE EMERGENCY SYSTEM DURING NATURAL DISASTERS: THE PHILIPPINE EXPERIENCE

Estrella J. Olonan-Jusi, MD
Manila, Philippines

The health and nutrition of infants are placed at risk during emergencies such as floods, typhoons, earthquakes, volcanic eruptions, and even manmade disaster. During disasters there is a limited access to safe food, water, health and nutrition services in the affected area that could lead to nutritional problems among infants. Moreover, breastfeeding can be disrupted for some infants. Hence, the Infant and Young Child Feeding during emergency (IYCF-E) promotes breastfeeding and continuous breastfeeding with optimal complementary feeding practices and do not accept breastmilk substitutes and other milk products donation in compliance with the Milk Code and International Code of Marketing of Breastmilk Substitutes.

With several calamities that happened in the Philippines, human milk banks have played a role in promoting, protecting, and supporting breastfeeding of babies who were victims of calamities or disaster to ensure adequate nutrition during difficult times. Human milk banks support breastfeeding of sick babies, those whose mother's own milk is not available and non-breastfed child through the provision of safe pasteurized donor human milk in addition to breastfeeding counseling and relactation support. However, there were challenges encountered in the transmission of donor human milk to the disaster area that should be considered such as the electricity and storage facility, transportation, trained staff for the proper handling and dispensing, and more importantly a sufficient volume of donor human milk available. Networking and proper coordination with all actors responding in emergency is also fundamental to facilitate the delivery of the donor human milk to the targeted infants. Thus, a policy framework for human milk banks in response to emergency is wanting.

HUMAN MILK CONTAINS A SITE-SPECIFIC MICROBIOTA

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Its composition may change depending on several factors, including gestational age, HMO milk profiles and medical treatments. In addition, human milk may become contaminated with microorganisms arising from the use of pumps or from other sources. Most HMBs submit donor milk to pasteurization for safety reasons; however, this process destroys the human milk microbiota. All these facts introduce new challenges to the future management of human milk in HMBs.

HUMAN MILK AND NEW VIRUSES

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Breastfeeding plays a vital role in infant health, providing numerous benefits including nutrition, immune protection, and maternal bonding. However, during the emergence of new viruses, concerns arise regarding the potential transmission of these pathogens through breast milk. This presentation explores the role of globalization and climate change in the emergence of new viruses and the risks associated with breastfeeding and the potential transmission of emerging viruses to the infant.
While some known viruses, such as HIV and CMV, can be transmitted through breast milk, new emerging viruses may have variable transmission patterns. Studies conducted during recent outbreaks of novel viruses like SARS-CoV-2 and Zika virus have shed light on this topic. Factors influencing transmission include the stability of the virus in breast milk, the viral load present, and the duration of breastfeeding. However, it is crucial to note that the mere presence of a virus in breast milk does not automatically translate to transmission. The infant's immune system and other protective factors within breast milk can play a significant role in preventing infection.
By addressing these points, we can help healthcare professionals and breastfeeding mothers make informed decisions regarding breastfeeding during outbreaks of emerging viruses.

IMPACT OF THE HMO CONTENT ON THE NEURODEVELOPMENT OF PRETERM INFANTS

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Master of Science in Engineering (MSc Eng) at AgroParisTech (1983) (Paris, France)
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He joined INRAE, the French Research Institute for Agriculture, Food and the Environment, in 1985.
Senior research scientist: In 2005, he joined PhAN lab (Physio-pathology of Nutritional Adaptations - INRAE Nantes) involved in the topics of neonatal nutrition and nutritional programming.
Author of more than 50 scientific publications, the more recent on the topic of perinatal nutrition.
Since 2015: Director, then Vice Director of the Human Nutrition Research Center - West (CRNH-Ouest)
Since 2022: Vice-President of EMBA

Premature infants are a vulnerable population at high risk of neonatal mortality and morbidity, stunted growth and impaired neurological development. Human milk is recommended for the nutrition of these children because of its health benefits. It is rich in many nutrients likely to have positive effects on the health of this more fragile population of children.
Human milk oligosaccharides (HMOs) are a group of complex carbohydrates, with up to 200 different molecules. There is considerable inter-individual variability in both HMO content and diversity.
The conference will review the associations identified between oligosaccharide content and infant neurodevelopment.

Conflict of interest: Nestlé (research support)

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NEW HUMAN MILK FORTIFIERS

Enrico Bertino[1], Giulia Maiocco[1], Laura Cavallarin[2], Marzia Giribaldi[2], Chiara Peila[1], Sonia Deantoni[1], Francesco Cresi[1], Paola Tonetto[1], Alessandra Coscia[1], Guido E Moro[3]

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Human milk (HM) ¬-- mother's own milk or donor milk - is the best nutrient for preterm infants. However, considering the high nutritional requirements of growing preterm infants, especially in the first period of postnatal life, HM should be appropriately fortified with proteins, calories, and minerals. At present, there are two main issues concerning fortification: which is the optimal fortification strategy, and which the optimal composition?
As regards fortification strategies, individualised fortification should be preferred to standard one, since it has demonstrated to improve body weight, head circumference, and length growth. Individualised fortification could be performed targeted (supplementation done after analysis of macronutrient concentration in HM), or adjustable (when monitoring protein adequacy by BUN). Nowadays, data are insufficient to establish which method is superior. Future studies should also examine the optimal time to commence fortification, as well as if and how to fortify milk after discharge.
Regarding composition of the fortifiers, at present almost all HM fortifiers are bovine based; however, this is not the optimal solution: for instance, bovine milk protein intake in the first months of life may lead to a pro-inflammatory status in the newborn intestine.
Human milk derived fortifiers are also available, but there is not sufficient evidence to recommend their routine use. Moreover, there are also ethical issues concerning their use and commercialization.
It is now known that donkey milk (DM) is more similar to HM than bovine milk (BM). Considering its benefits, in particular, in the treatment of subjects with severe allergy to cow's milk proteins, and its possible use in prevention/treatment of cardiovascular, autoimmune, and inflammatory diseases, it has also been speculated that DM could be suitable for the production of human milk fortifiers for feeding preterm infants. In our Research Project, a novel DM-based fortifier has been developed. It has demonstrated to improve feeding tolerance and to reduce gastroesophageal reflux episodes in preterm infants when compared to a bovine derived fortifier, with similar short-and long-term auxological outcomes, and long-term neurodevelopmental outcomes. These results suggest that our DM-based fortifier could be a promising alternative to currently available BM-based fortifiers.

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LEGISLATION AT EUROPEAN LEVEL

Silke Mader
EFCNI

To recognise human milk as the best option for preterm, sick and low birthweight infants and has, at its core, the theme of ensuring a safe, secure supply for all mothers in need of milk for their infants.

- ensure equitable access to safe donor human milk for infants in need and accounts for the practical specifics of human milk donation.
- endorse recognition, support and regulation of human milk banks in Europe.
- include the need for EU-wide research and data collection of human milk donation and use.

Main messages
Addressing the current status quo of the EU regulation process for human milk to provide high risk neonates with safe human milk that saves lives and improves quality of life and which must be considered a public health priority and a human right for all newborns

WHO GUIDELINES ON HUMAN MILK BANKING

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There is growing interest in creating and sustaining human milk banks globally to fulfill the need for donor human milk. Human milk banks have now been established in over 60 countries globally, with a small but increasing number of milk banks operating in low-income and middle-income countries. WHO and the University of Zurich co-sponsored an international expert meeting in 2019 to examine issues on the implementation, operation, and regulation of human milk banks. The meeting identified a need for global guidance on the quality and safety of human milk banking. In February 2022 WHO announced that formal guidelines would be prioritized, led by the Department of Nutrition and Food Safety. The formal WHO guidelines development process includes the following steps: WHO Guideline Steering Group formed to drive process, Guideline Development Group formed to determine questions, finalize in PICO format, Systematic Reviews performed, Evidence assessment performed, Recommendations determined, Guideline produced and published with WHO Guideline Review Committee approval, Implementation and Evaluation of Guideline.
PATH was selected to serve as coordinator to assist WHO through this process. In 2022, WHO formed a Guideline Development Group (GDG) for this purpose and, in December of 2022, convened the first of several planned GDG meetings to discuss key questions and review the evidence to inform the guidelines. A second GDG was held in March 2023, where a first set of priority questions for recommendations on human milk banking was developed. Topics being explored currently include impact of storage and treatment on human milk, impact of maternal characteristics and expression practices on human milk, impact of stages of lactation on outcomes and milk supply, impact of feeding milk from various situations on infant health outcomes. Guidelines will be developed to inform minimum recommendations to ensure safety and quality of donor human milk and are meant to be adapted to local guidelines to ensure feasible implementation. Guidelines are expected to be completed in early 2024.

CULTURAL DIFFERENCES IN MILK DONATION

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Introduction
Milk donation has expanded exponentially across the globe, particularly in this century, and relates to the medical support of an exclusive human milk diet for vulnerable neonates. The global expansion of this health policy ignores cultural diversity and difference, assuming, incorrectly, that there is a singular 'culture of milk donation' underlying this global intervention. However, deep differences exist, even regarding what we mean by milk donation itself. Such differences need to be considered carefully as the expansion continues.

Methods
We will discuss ethnography, which is a method primarily associated with Anthropology, and literally translates as 'Writing Culture'. We will explore how I have conducted ethnographic research on donor human milk across Europe, North America and globally.
Results
What do we mean by culture? We think we know what we mean when we use the term culture, but for cultural researchers, and in particular Anthropologists, this is a very complex question. I will offer some of the most popular models of culture (the Iceberg model, the tapestry model and the garden model), inviting us to finally look at the heuristic of the cultural diamond. We will talk about the layers of cultural meaning involved in human milk donation globally.

Discussion
My colleague, the Canadian anthropologist Professor Penny van Esterik, a long time breastfeeding advocate who worked closely with WABA for many years, has argued that breastfeeding is and should be considered a culture bridge since maternal milk is flavoured by their mother's diet which is in turn cultural informed is the first exposure to culture that we can experience. These experiences are shaped by our culture. What we eat when breastfeeding, and whether or not we breastfeed have all been shown to be linked closely to our meanings about what it means to be a parent, which includes how we feed our infants. The experiences of allomaternal nursing (feeding other peoples' infants) is also something anthropologists have long discussed and is charged with of cultural meaning.
I will conclude my discussion by exploring how human milk donation can be linked to clinical features of thinking about the traditional concept of cultural competency, and the more recent and more anthropologically informed concept of cultural humility. Culture matters, and yet culture is complex, but this acknowledged complexity demonstrates how to navigate the worlds of meaning. Recently MIT Professor of Anthropology, Heather Paxson, argues culture is a meaning-making practice, and is "a way of making sense of, adapting to — and, sometimes, resisting — economic, political, and other structural conditions." Socio-cultural researchers like myself try to make visible these meaning-making practices in the many worlds of donor human milk donation.

DIFFERENT MILK BANK MODELS TO INCREASE THE AVAILABILITY OF DONOR HUMAN MILK IN EUROPE

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For premature infants worldwide, donor human milk (DHM) is unequivocally recommend as first alternative if maternal milk is not available. The actual extent to which this recommendation is applied in clinical practice is unknown since comprehensive data about the use of DHM in different health care systems are not available. Several reviews of clinical practice indicate that even in countries with established DHM programs only a fraction of eligible infants receive DHM.

Different operator models of human milk banks are in place in Europe and some of them may be more beneficial in facilitating supply and equity access of DHM than others.
A single stand-alone milk bank operated by and serving for a single neonatal unit is the predominant operator model in European countries. DHM is procured from a limited donor pool and may or may not be sufficient for this specific neonatal unit since milk procurement may be very fluctuating and unpredictable.

In case of an excess of milk, this unit may expand the pool of eligible patients based on internal prioritization guidelines and commence supplying other neonatal units without the means of operating a milk bank. However, if demand exceeds supply milk deliveries to dependent units may be abruptly and unforeseeable terminated. This could lead to an abrupt shortage of DHM for extremely preterm babies in those dependent units while DHM may be dispensed to term babies those unit that operate milk banks, as observed in clinical practice.

Therefore, to generally increase the amount of DHM available to preterm infants, to decrease inter-unit dependency and to establish an equity access for DHM operating models other than stand-alone milk banks need to be established. A hub-and-spoke network approach whereas a number of smaller milk collection facilities are interconnected via a limited number of high-capacity milk banks represent such an alternative network-model.

Within a network-model, neonatal units or other health care facilities may collect milk from departmental donors or from the local community acting as local depots. These donations are subsequently forwarded to central high-capacity milk banks (hubs) where the DHM will be processed, labelled, stored and dispensed to a participating network neonatal unit in need of DHM. Central hubs provide the standards of donor recruitment, staff, technical and digital infrastructure for milk processing. Costs and efforts are concentrated in the hubs with the aim of decreasing barriers for using DHM and to facilitate reimbursement from cost providers.

HUMAN MILK BANKING – INDIAN SCENARIO

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Improving breastfeeding rates worldwide is one of the fundamental drivers to achieve Sustainable Development Goals by 2030. However, due to various challenges, some of these neonates are devoid of Mothers' own milk (MOM). Alternative feeding choices for small and sick neonates include milk of animal origin or infant formula milk, which is more often associated with a high risk of sepsis and necrotizing enterocolitis, thus significantly decreasing the chances of intact survival of the vulnerable small and sick neonates (SSN). In such scenarios, pasteurised donor human milk is a safe alternative.
In India, the model conceptualised for human milk banking (HMB) is a Comprehensive lactation management centre (CLMC) rather than HMB, to emphasize antenatal counselling, postnatal counselling and support to the mother to initiate breastmilk feeding while in the birthing facility and help her sustain it till 6 months post-discharge, along with safe collection, processing, handling, storage and disbursement of PDHM. "National Guidelines on Lactation Management Centres in Public Health Facilities" was launched in July 2017. So, the main focus is initiating MOM to the baby either by direct breastfeeding or as expressed milk for SSN in the intensive care unit, fed via an orogastric tube or by cup/spoon.
These guidelines focus on the establishment of CLMC to serve as a lactation support centre to support breastfeeding, as well as to safely collect, handle, process, store and disburse safe PDHM; lactation management units (LMUs) to facilitate the expression and collection of MOM for her infant's use at first referral units/subdistrict hospitals; and lactation support units (LSUs) at all delivery points to provide round-the-clock breastfeeding support, lactation counselling, and kangaroo mother care support to mothers. Hence the concept is to provide Mothers' own milk rather than mothers' milk.
India bears the highest global burden of neonatal births and deaths, therefore improvement in neonatal health indicators will help to reduce neonatal mortality and morbidity. HMB could be an initiative to achieve such a goal. A decentralized model 'Hub and spoke' can pave a pathway to resolve logistic issues related to the establishment of HMB at each healthcare centre.
This is a concept where multiple affiliated collection centres located in hospitals or in community, enrol, consent, train and support donors, and temporarily store donated milk, in compliance with the HMB protocols. The collected milk is then transferred to the HMBs for pasteurisation and stored until distribution back to the institute from where it is being collected. This model could help cadre the need of many small and sick neonates.

THE GAMBA EXPERIENCE

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Human milk banking continues to increase both in individual countries and globally. Currently, over 760 milk banks are operational in 70+ countries. In Europe the numbers have doubled since being estimated at 150 in 2010[1].

Prior to 2020, global networking opportunities were mainly limited to attendance at a few international meetings. One of the main legacies of the Covid-19 pandemic has been the emergence and normalisation of online meetings and the growth of virtual networks.

Covid-19 introduced new challenges for milk banks everywhere and in an attempt to facilitate the sharing of experiences and support, a WhatsApp global group was created in March 2020. This quickly grew to become the largest global network dedicated to those with expertise in fields related to human milk banking and the use of donor human milk. It enabled the rapid sharing of information in response to questions posed by members.

The origins of the global network, entitled the Global Alliance of Milk Banks and Associations (GAMBA), came from a meeting hosted by the University of Zurich's Institute of Biomedical Ethics in association with the World Health Organisation in 2019. The meeting was dedicated to defining knowledge gaps within human milk banking and to determining the need for global guidelines. The discussions between experts drawn from across the globe highlighted the need for easy ongoing access to this pool of experience and expertise. Covid-19 accelerated both the need and the means by which it could become a reality.

The initial output arising from the formation of GAMBA were publications calling for action in response to the pandemic[2] and to a summary of the global response made possible by the group[3]. The ability to instantly share news, events and information was appreciated by all, as was the rapid response to requests for advice, suggestions and answers to problems.

Working together with the Brazil based milk bank network, celebrations of the World Day of Human Milk Donation have increased year on year. The 2023 theme, A Small Gesture Can Feed a Big Dream – Donate Breastmilk! was chosen from over a thousand entries and celebrated by sharing the 'big dreams' of families and colleagues from around the world on social media and through the release of a GAMBA video compiled by the Human Milk Foundation (UK) and Alive and Thrive (Vietnam)[4].

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HUMAN MILK BANKING IN NORTH AMERICA

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The Human Milk Banking Association of North America (HMBANA) accredits thirty-two non-profit milk banks in United States and Canada that dispensed nearly 10 million ounces of milk in 2022. HMBANA milk banks offer services that extend beyond milk distribution, including lactation support, health equity work, human milk research, bereavement donation support, and discounts that reduce the cost of milk for outpatient families. Access to these services is impacted by policies, politics, and access to health care coverage. Geography influences utilization of donor milk in the neonatal intensive care, highlighting a fragmented healthcare system and structural inequality that limits access to this lifesaving resource. Despite these challenges, HMBANA milk banks are unified in their commitment to safety, innovation, and ethical milk banking. HMBANA's accreditation program relies on quality auditing principles and the U.S. Food and Drug Administration's food safety framework. Increased use of technology at HMBANA milk banks improves safety, quality, and efficiency.

HUMAN MILK BANKING IN SOUTH AFRICA – A TALE OF TWO REALITIES

Anna Coutsoudis
Durban, South Africa

Historical Background
First HMB opened 22 years ago specifically to feed AIDS orphans. Over time milk banks were set up in hospitals for preterm infants and there was a need for regulation/networking, this resulted in a group of health professionals forming the Human Milk Banking Association of South Africa.

Roll out of Human Milk Banks (HMBs) in government hospitals
In 2011 South Africa Ministry of Health (MoH) was concerned about our low breastfeeding rates and poor infant mortality stats and committed itself to renew their efforts to protect, promote, and support breastfeeding. One of the strategies to address this was to roll-out human milk banks in the NICUs. At this point MoH became involved in milk banking. This year the MoH will release national regulations requiring all milk banks to meet stringent requirements, chief of which is that they are BFHI facilities.
Even although government is committed to funding milk banks in government hospitals, the reality is that they have limited financial resources and are becoming aware of the problems associated with expensive state-of-the-art human milk banks. One innovation to counter this, is using a low cost pasteurizer which pasteurizes and cools 3 bottles of milk in approx. 17 minutes using a simulated flash heating method. This innovation has made it possible for many more smaller milk banks to be set-up especially in rural areas, preventing the excessive transport of donor milk across large distances.
Our second innovation has been to introduce a point of care method for testing sterility of the milk following pasteurization.

Introduction of HMBs in private hospitals and private stand-alone facilities
There has been a large increase in HMBs in private hospitals and there are several stand-alone facilities that collect donor milk from donors and process it for onward supply to mainly private hospitals. Processing costs are however high and need to be recouped from private patients.

Danger that commodification of donor human milk inadvertently undermining breastfeeding?
Only way to prevent this is to provide accurate information that DHM is not equivalent to MOM, and ensure that best practices are in place to support breastfeeding in the NICU. The dream for IYCF colleagues in South Africa is that: *equity in breastfeeding support will become so commonplace that all babies receive their own mother's milk as a priority and that DHM is only used as a short-term bridge in exceptional cases.*

MDA'S NATIONAL HUMAN MILK BANK OF ISRAEL

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Director, the National Human Milk Bank of Israel, Ramle

Magen David Adom (MDA), Israel's National Emergency Medical and Blood Services Organization, is Israel's National Red Cross. During 2018, as a joint operation with the Ministry of Health, the National Human Milk Bank of Israel was established as part of MDA's National Blood Services. Since 2021, the National Human Milk Bank of Israel provides 2 types of pasteurized donor human milk (premature and mature) to 23 NICU's all over Israel based on a weekly order. In the period of 1/2021 until 6/2023, the National Human Milk Bank distributed a total of 5,250 liters of milk to needed premature infants, with an average of 175 liters per month. On 11/2022, the milk bank has moved to the new facility of the National Blood Services in the city of Ramle and named after the Sussman Family Foundation.
We had several unique challenges in Israel, besides a hot climate, many families are bigger and the houses are small so it is hard to maintain high hygiene standards. In addition, as many of the milk donors are multiparous and their risk of pregnancy related nutritional deficiencies is unclear, we decided to mix 4-10 donors. In order to reduce the number of failed batches, we developed a pre-batching screening method and adopted robust hygiene protocols. Consequently, although we have ~4% of donated milk with above 10^4 pathogenic counts and ~2% of donated milk contaminated with B. cereus, all pre-screened batches have succeeded. In my talk, I will introduce our facility with an emphasis of our novel milk processing and pre-screening methodology.

NETWORK OF HUMAN MILK BANKS IN THE ISLAMIC REPUBLIC OF IRAN

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Abstract

Donor human milk is increasingly being used as an alternative to infant formula due to its advantageous nutritional and biological properties when the mother's milk is not available. Human milk banks (HMBs) facilitate the collection, processing, and distribution of donor human milk. Currently, more than 750 HMBs exist in over 65 countries, with the vast majority situated in North America, Brazil, and Europe. The first Human Breast Milk Bank in Iran was established at Al-Zahra Teaching Hospital of Tabriz, affiliated with Tabriz University of Medical Sciences (TUOMS), in 2016. After establishing the first milk bank in Tabriz, the Ministry of Health, and Medical Education (MOHME) decided to extend the number of breast milk banks in the country due to requests from many NICUs from different parts of the country, and the result of a study showed that launching the human milk bank in Alzahra teaching hospital in Tabriz significantly improved the outcomes of premature infants.

It was clear that running a breast milk bank without having a pasteurizer machine was impossible, but we had many problems purchasing the machine from overseas due to sanctions and difficulties in transferring money. Hence, we established a knowledge-based company at TUOMS to investigate the structure of human milk pasteurizer machines and manufacture it in Iran. Resultantly, Matin Promoter of Breast Milk Bank Co. successfully manufactured the machine (BM Pasteurizer with the brand name Pasteumom), received the necessary national certificates after technical evaluation, and commercialized the machine.

The number of milk banks gradually increased and reached eleven in 2022 with financial and logistic support from the Ministry of Health and Medical Education (MOHME) and collaboration with the Human Milk Bank of Alzahra Teaching Hospital of Tabriz. They were located in: Tehran (the capital city of the country has two), Tabriz, Mashhad, Yazd, Isfahan, Kerman, Kermanshah, Ahvaz, Zahedan, and Shiraz. All of them were established in university hospitals with large Neonatal Intensive Care Units (NICUs).

There are no privately operated human milk banks in Iran. The eleven operating milk banks work as a network and are organized and supervised by the Neonatal Health Office of MOHME. The registration system of the Neonatal Office collects data from milk banks as: donor numbers, the amount of milk collected and pasteurized, and the number of recipient infants.

During the year 2022, the Human Milk Bank of Alzahra Teaching Hospital in Tabriz had 87 donors and pasteurized 1,754 liters of breast milk for 733 infants manly preterm who were admitted to nine different hospitals in the province.

Milk kinship is an Islamic belief, unlike many mothers in some Islamic countries (3), most mothers in Iran are interested in donating milk and have no problem with accepting milk for infants . In Iran, where 98 percent of the population is Muslim, 89 percent are Shi'a and 9 percent are Sunni. Non-Muslims are estimated to account for 2 percent of the population.

Based on Shia principles for forming milk kinship, the following conditions are necessary: the infant should be breastfed at least fifteen times or be breastfed one complete day and night, or be breastfed in an amount that can be said to have strengthened their bones and flesh. Breast milk should be suckled directly from the breast, and feeding by spoon or NG Tube is not compatible with mahram rules. The milk should not be mixed with anything else. These conditions will not apply to donated milk in breast milk banks. To well define milk kinship or forming mahram illusions, a permission letter was also obtained from the current Supreme Leader of Iran, who is also a famous Marja in the country. For some parts of the country with a Sunni population, our approach is receiving milk from a single donor for only one recipient infant, which makes it easier to trace milk relationships. Additionally, the donor and recipient parents meet before the exchange, similar to the approaches used in Kuwait and Indonesia's milk banks (4)."

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HIGH-TEMPERATURE SHORT-TIME PASTEURIZATION: CLINICAL EXPERIENCE AND RESEARCH

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High-temperature short-time (HTST) pasteurization (72-75°C, 15 s) is an alternative treatment to Holder pasteurization (HoP) (62°C, 30 min) for donor milk. HTST pasteurization guarantees the milk's microbiological safety and retains more of its biologically and nutritionally active compounds. The specific needs of the Regional Human Milk Bank of the Community of Madrid, Spain were considered to design an HTST equipment for the continuous and adaptable processing of donor milk (PCT/ES2016070594). To date, no experience has been documented worldwide of the use of this technique in other milk bank.
We have been using this equipment from May 2020 to June 2023. During this period, 194 batches with a total volume of 1302 liters were pasteurized using this technique. Milk from 2 to 6 donors was mixed. Two batches were discarded due to Bacillus cereus and Enterococcus faecalis contamination. Mean nutritional values (g-Kcal/dL) of the batches was protein 1.20±0.16, fat 3.13 ±0.636, calories 65.45±6.16 and overall acidity 3.43±1.15 ºDornic.
Two research studies related to HTST versus Holder pasteurization will be presented. The first one consists of a randomized double-blind clinical trial in premature babies with a birth weight of less than 1000 grams whose main objective was to compare the incidence of confirmed sepsis as a function of the type of pasteurized donor milk they had received during their admission to the neonatal unit (ClinicalTrials.gov ID: NCT04424667).
On the other hand, a cost-minimization study was carried out. Total production costs were quantified using HTST pasteurization and HoP in three hypothetical scenarios: (1) costs of the first 10 L of pasteurized milk in a newly opened milk bank; (2) costs of the first 10 L of pasteurized milk in an active milk bank; and (3) costs using the maximum production capacity of both technologies in the first two years of operation. In scenario 1, the total production costs were € 228,097 for the HTST method versus € 154,064 for the HoP method. In scenario 2, these costs were similar (€ 6,594 for HTST pasteurization versus € 5,912 for HoP). The opportunity cost for healthcare professionals was reduced by more than half when pasteurization was carried out by the HTST method versus the Holder method (€ 84 and € 191 respectively). In scenario 3, the unit cost of milk pasteurized by the HTST method decreased from the first to the second year by 43.5%, while for the HoP method, it decreased by 30%.

IMPACT OF DONORS DIET ON HUMAN MILK COMPOSITION

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The use of donor human milk (DHM) as the second best feeding option is increasing in neonatal units for infants weighing <1500 g and/or those at less than 32 weeks of gestational age, infants with congenital heart disease, or those with severe intestinal disorders. Most of them are in a critical situation regarding their nutritional needs. Therefore, the lack of studies investigating the nutritional composition of DHM as well as possible associations with donors' diet are concerning, moreover, since findings in mothers' own milk should not be generalised to DHM.

Hence, we will present the results of three studies regarding the research of DHM in 113 donors. All of them provided a 5-day weighed dietary record and collected milk for five consecutive days. Nutrient determinations in donors' milk were analysed by chromatographic techniques, mass spectrometry and immunoassay determination. Multiple linear regressions were conducted for the evaluation of associations.

In this sense, one study focused on fatty acid profile and the concentration of vitamins and minerals in DHM and their adjusted associations with diet, as an opportunity to increase the content of diverse nutrients in DHM. The observation of a positive association between DHA average intake and its concentration in DHM (95 % confidence interval [CI] = 0.234-0.530) was of great interest due to the role of this nutrient in the visual and cognitive development of neonates. Additionally, the concentration of free riboflavin in DHM showed a positive association with intake and supplementation whereas 25(OH)D3 with supplementation. Other associations found were between DHM concentrations of free thiamine, dehydroascorbic acid, and cholecalciferol and the average daily intake of diverse food groups rather than the intake of the nutrient themselves.

In a second paper, the DHM iodine content was investigated more specifically because of its great importance in infant's development. We showed that the supplementation with iodine might be able to increase its concentration in DHM (95% CI=0.135-0.310).

Owing to the frequent rejection of vegan and vegetarian for human milk donation, a third investigation compared DHM content between omnivore donors and vegan/vegetarian lactating women. Differences between these two groups were observed, mainly due to the lower DHA content in the milk of the vegan/vegetarian group (0.15 vs 0.33 g/100g of total fat, $p<0.001$). However, appropriate supplementation could address this gap, as in the case of cobalamin, which concentration in DHM was found to be higher in vegetarians/vegans and which might be related to supplementation.

HOW CAN WE IMPROVE THE ENVIRONMENTAL HEALTH OF MILK DONORS?

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Many industrial chemicals as heavy metals and persistent organic pollutants, pose risks to human health and the environment. Others, as bisphenols, phthalates, parabens, pesticides, benzophenones, polybrominated and perfluorinated compounds, are of concern because of their endocrine disrupting properties. After intensive human biomonitoring exercise/programs in Europe, non-governmental organizations and scientific consortia have called for stronger regulations and policies to better assess and manage the risks associated with environmental chemicals. They advocate for the implementation of the precautionary principle and the adoption of stricter standards for chemical safety, including the identification and substitution of hazardous substances. They also have signaled life periods of special concern for chemical exposure, e.g., pregnancy, lactation, infancy and childhood. Exposure to newborn and infant to these substances has been linked to developmental disorders, hormone disruption, reproductive issues and respiratory problems, among others.

Milk banks play a crucial role in collecting, processing, and distributing donated human milk to infants who are unable to receive their mother's milk. To ensure the safety of donated milk, Milk banks follow guidelines and recommendations regarding donor health history, strict processing procedures, compliance with regulatory standards and collaboration with healthcare professionals. We propose that, in order to avoid infant exposure to chemical contaminants, Milk banks should also incorporate new guideline recommendations: i) Donor Screening: Milk banks should carefully screening donors in order to identify potential exposure to chemical contaminants in food and water, outdoor and indoor exposure, and use of cosmetics; ii) Donor Instruction: On how to reduce chemical exposure, at least during the time of donation, with special emphasis through dietary, cosmetics and environmental exposures habits; iii) Milk Testing: incorporating controls for prioritized substances, e.g. persistent and endocrine disrupting chemicals, in addition to certain medications or drugs.

Reducing chemical exposure of lactating mothers implies taking into account potential sources of chemicals and adopting practices that minimize contact with harmful substances, for example: i) Choosing organic foods; ii) Avoiding smoking and secondhand smoke; iii) Selecting personal care products; iv) Minimizing cleaning products and limiting exposure to household pollutants; v) Avoiding certain fish; vi) Being mindful of food packaging; vii) Filtering tap water; and viii) Minimizing exposure to outdoor pollutants.

Although the benefits of donated milk, which provides essential nutrition and immunological support to vulnerable infants, outweigh the potential risks of chemical exposure, we must ensure that this evidence remains valid in the exposure scenario of women in the XXI century.

ORAL COMMUNICATIONS

COD. OC 01

GOT (OPTIMAL MILK)? POOLING DONATIONS IN HUMAN MILK BANKS WITH MACHINE LEARNING AND OPTIMIZATION

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Human donor milk is considered the ideal nutrition for the millions of preterm infants born each year. Donor milk is collected, processed, and distributed by milk banks. The macronutrient content (e.g., fat, protein, etc.) of donor milk is directly linked to infant neurological development and can vary substantially across donations. As a result, milk banks typically pool multiple donations together to create final products that aim to meet macronutrient targets. However, approximately half of all milk banks in North America do not have the equipment or resources to measure the macronutrient content of donor milk, and instead pool using heuristics and clinical intuition. For these milk banks, an approach is needed to optimize pooling decisions.

In this project, we engaged in a multi-year collaboration with the Rogers Hixon Ontario Human Milk Bank (RHOHMB), one of four non-profit milk banks in Canada, to develop and implement a data-driven framework for prescribing pooling decisions without access to macronutrient measurements. We collected a novel and extensive dataset from RHOHMB on donors and measured donation macronutrients over a total 18-month period between 2018 to 2022. This data was used to fit machine learning models to predict the macronutrient content of incoming donations, while accounting for the shift in macronutrient content over time. Then, we designed a robust optimization model to pool donations using predicted macronutrient values, accounting for estimation error, operational constraints, and constraints around limiting bacteria levels. Our optimization models were iteratively revised using extensive feedback from RHOHMB staff and further finetuned through a simulation framework based on the data collected from RHOHMB.

We implemented our framework at RHOHMB as a software program that ingests data on donation and donor information, runs our machine learning and optimization models, and outputs pooling recipes for milk bank staff. To validate, we ran a one-year pre-post trial comparing against the status quo, where nurses manually tracked the expiration date of available donations and created recipes using the soonest-to-expire donations, subject to operational constraints. From November 1, 2021 to May 3, 2022, we measured the fat and protein content of the nurse-created recipes, recipe-creation time, and the number of pools that met bacteria thresholds. Then, from June 1, 2022 to Nov. 15, 2022, the milk bank used our model to create recipes. The proportion of pools that met the clinical fat target increased from 43.6% to 56.9%, while the proportion that met the clinical protein target increased from 52.9% to 70.1%. These represent relative increases of 30.5% and 32.5%, respectively, and are statistically significant based on Chi-square tests. An interrupted time series analysis, which accounted for serial correlation, confirmed that our intervention significantly improved fat and protein content in pools. Finally, recipe creation time decreased by 60%, while the number of pools meeting bacteria thresholds remained unchanged.

COD. OC 02

GLOBAL STUDY TO CHARACTERIZE NUTRIENTS IN DONOR HUMAN MILK: PRELIMINARY FINDINGS ON MACRONUTRIENTS, METABOLIZABLE ENERGY, AND B-VITAMINS

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BACKGROUND: Donor human milk (DHM) plays a critical role in preterm infant feeding given evidence of protection against necrotizing enterocolitis. However, there is also evidence of inferior growth and a dearth of data on nutritional composition assessed using preferred analytical methods.
OBJECTIVE: To assess the macronutrient and B-vitamin composition of milk from approved milk bank donors around the world using preferred analytical methods and compare to preterm nutrition recommendations.
METHODS: Samples (n=600) were obtained from eight geographically and economically diverse milk bank settings (Chile, Kenya, Poland, United States [n = 4 milk banks] and Vietnam). Each sample reflected raw milk from a unique, approved donor collected over at least 3 days and combined into a Single Donor Pool. Matched, Holder pasteurized samples (n=50) were also obtained to account for the impact of pasteurization. True protein, fat, lactose, HMOs, metabolizable energy, and B-vitamins were assessed using preferred analytical methods. Results were compared to ESPGHAN nutritional recommendations. Where recommendations were provided as a range, the midpoint was used. Preliminary nutrient data presented here reflect n=600 samples for macronutrients and n=340 samples for B-vitamins.
RESULTS: Most donors (82%; 493/600) gave birth at term and most Single Donor Pools represented milk collected after 4 weeks postpartum (82%; 491/600), with geographic differences noted. The average number of days in a Single Donor Pool was 37, and the average lifetime donation volume of the donors was 31 liters. There was more variability in B-vitamins (coefficients of variation from 36% to 370%) than in macronutrients (coefficients of variation from 7% to 23%). Holder pasteurization resulted in a small but significant decline in vitamin B12 and pyridoxine (mean decrease of 11.9% and 3.6%, respectively; $p < 0.05$), but no decrease in riboflavin, niacin, pantothenic acid, biotin, or macronutrients. Assuming full feeds of 165 ml/kg/day, several nutrients were low or below ESPGHAN recommendations including (mean, standard deviation): true protein (1.4, 0.4 g/kg/d; 37% of recommendation); metabolizable energy (98, 11 kcal/kg/day; 77% of recommendations); vitamin B12 (0.1, 0.1 µg/kg/day; 29% of recommendations); riboflavin (47, 27 µg/kg/day; 15%of recommendations); niacin (248, 90 µg/kg/day; 7% of recommendations); and pyridoxine (25, 14 µg/kg/day; 14% of recommendations).
CONCLUSION: The mean true protein and metabolizable energy values we report are lower than clinical reference values for DHM in the United States (0.9 vs 1.2 g/dL for true protein; 17.5 vs 19.2 kcal/oz) highlighting the need for reliable reference values. True protein, metabolizable energy, and multiple B-vitamins do not meet current ESPGHAN recommendations which supports the importance of fortification. Whether setting-specific fortification protocols achieve nutrient recommendations when used with DHM remains to be studied. The impact of pooling multiple donors also warrants further investigation as a strategy to reduce micronutrient variability and optimize nutritional composition.

COD. OC 03

CAN A HUMAN MILK BANK IMPROVE MOTHER'S OWN MILK USE FOR VERY LOW BIRTH WEIGHT INFANTS IN NICU? THE VICENZA EXPERIENCE

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Introduction

Human milk (HM) for preterm newborns is the standard of care for nutrition. When mother's own milk (MOM) is insufficient, human donor milk can be used as an alternative. One of the main purposes of a human milk bank (HMB) in a Neonatal Intensive Care Unit (NICU) is also to improve the use of MOM for feeding newborns.

Objective

To evaluate if the establishment of a HMB in a NICU can determine an increase in MOM use for very low birth weight (VLBW) infants (< or = 1500 g).

MethodsIn this retrospective observational study, including 629 VLBW infants born in a 3rd level Italian NICU, from 2009 to 2022, we compared the type of milk: exclusive MOM, MOM and formula, only formula, administered at discharge/transfer from NICU before and after the opening of the HMB in 2015. A subgroup analysis was performed for newborns less than 29 gestational weeks (GW) at birth.

Results

We included 298 VLBW newborns born from 2009 to 2015 and 331 newborns from 2016 to 2022. The 2 populations were comparable for birth weight: media 1038 g ± 329 SD vs 1042 g ± 304 ($p > 0.5$) and for gestational age: media 28 ± 3 GW vs 28 ± 2.9 ($p > 0.5$). Two hundred and six (69%) newborns of the 1st period vs 268 (84%) of the 2nd period were discharged on MOM (OR 1.9, CI 1.3-2.7, p=0.0006). Then, 68 (23%) newborns of the 1st period vs 164 (50%) of the 2nd period were discharged on exclusive MOM (OR 3.3, CI 2.3-4.7, $p<0.0001$). In the subgroup of babies born less than 29 GW, 114 (66%) newborns of the 1st period vs 162 (77%) of the 2nd period were discharged on MOM (OR 1.7, CI 1.1-2.7, p=0.00152). In the same subgroup, 38 (22%) newborns of the 1st period vs 101 (48%) of the 2nd were discharged on exclusive MOM (OR 3.2, CI 2-5.1, $p<0.0001$).

Conclusions

The short and long-term benefits of the use of HM for preterm infants are well known. In this study, a HMB opening significantly increased the number of VLBW infants receiving MOM and exclusive MOM feeding at discharge, also at lower gestational age.

COD. OC 04

APPLICATION OF NANOSECOND PULSED ELECTRIC FIELD (NSPEF) TREATMENT IN DONOR HUMAN MILK

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Background: In many countries around the world, donor human milk undergoes thermal processing as a standard procedure to ensure its microbiological safety. This conventional approach, known as holder pasteurisation (HoP), heats the milk to a temperature of 62.5°C for 30 minutes. This thermal treatment often has detrimental effects on the essential antimicrobial components present in human milk, which are crucial for providing immunity to newborns. Thus, alternative pasteurisation methods that do not rely on heat, such as nanosecond pulsed electric field (nsPEF), may be beneficial in maintaining the quality of donor human milk. This study aims to investigate the potential effects of nsPEF treatment on raw donor human milk.

Methods: Donor human milk was obtained from anonymous consenting donors at the Royal Brisbane Women's Hospital (Queensland, Australia). The bacterial culture of Escherichia coli JM109 was incubated for 24h to grow to 10^9 CFU.mL−¹ and then washed twice by centrifuging with sterile 0.85% (w/v) saline solution for 5 min at 10,000 rotations per minute. The washed E. coli suspension was then added to either MilliQ water or HoP-treated (pasteurised) donor human milk to achieve the target initial count (approximately 8 log CFU.mL−¹). The raw human milk and E. coli inoculated samples were treated using a continuous nsPEF system, set up at a flow rate of 100mL per min. A total of 240k pulses (60k pulses per step, 5 min resting time between the steps) were applied at 20kV, and 50Hz frequency using a pulsed power generator. An infrared thermal camera was used to measure the temperature of the treated sample both before and after each pulsing step. The total number of bacteria was enumerated in processed samples using tryptone soya agar (TSA) and the plates were incubated at 37°C for at least 48h before enumeration.

Results: In the inoculated MilliQ water sample with an initial E. coli count of approximately 8 log CFU.mL−¹, a reduction of approximately 4.4 log in total plate count was achieved after the nsPEF treatment. The E. coli inoculated HoP-processed human milk sample on the other hand, with a comparable initial bacterial count, showed a reduction of approximately 5.3 log in total plate count. The raw human milk sample had an initial total bacterial count of 10^1 CFU.mL−¹. Following the nsPEF treatment, this sample exhibited complete inactivation of all microorganisms. Throughout the treatment, all three samples maintained a measured temperature below 35°C.

Conclusions: This study explored the potential of nanosecond pulsed electric field (nsPEF) treatment as an alternative to thermal treatment for pasteurising donor human milk while preserving its beneficial properties. The continuous nsPEF treatment effectively pasteurised the raw human milk sample and up to 5 log reduction was achieved in donor human milk inoculated with 10^8 CFU.mL−¹ E. coli. Importantly, the nsPEF treatment was conducted at a significantly lower temperature than the thermal processing methods, thereby potentially maintaining the integrity of the essential nutrients in human milk.

COD. OC 05

THE MICROBIOME OF DONOR HUMAN MILK: A MULTI-CENTER STUDY. ARTIFICIAL INTELLIGENCE IDENTIFIES MULTIPLE ASSOCIATIONS BETWEEN MICROBIAL COMPOSITION, DIVERSITY, MILK COMPOSITION, AND MATERNAL DIET

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Human breast milk is an optimal source of neonatal nutrition and has a rich microbiome that can convey lifelong health benefits to recipient babies. The composition of the of the microbial commuities present in donated milk is known to vary, although the relative importance of different factors on the milk microbiome requires more extensive investigation. We sought to characterise the microbiota of milk donated in different European countries and examine relative associations between microbial composition and biochemical consituents, maternal diet, lifestyle and location. Microbiota of 213 donated human milk samples from 98 women from Poland, Italy, and the Netherlands were assessed at different time points during the first 3 months postpartum. Milk samples were analysed prior to pasteurisation and microbial DNA was successfully isolated in nearly 200 cases using an optimized protocol and subjected to metataxonomic profiling using 16S rRNA sequencing. Women also provided extensive dietary, lifestyle, and social information. In parallel, donated milk samples were analysed for biochemical and nutritional composition to create a rich metadata set to assess the factors influencing donor milk composition. Microbiota populations were statistically assessed using an array of advanced statistical tools appropriate for complex datasets. Our investigations of the α-diversity (a measure of intrasample species richness and diversity) reveal that at a high level, the donor human milk examined was rich and stable. Analyses of β-diversity (a measure of intersample species richness diversity) revealed an underlying, high dimensional structure, where samples largely formed location dependent clusters, independent of timepoint. This was particularly evident from Jaccard indices (microbial incidence data). In addition, artificial intelligence was used to further identify two cohorts of donor milk with discrete microbiota that clustered independent of geography and time.

COD. OC 06

DEVELOPING METHODOLOGIES TO IMPROVE RECOVERY AND PROFILING OF MICROORGANISMS FROM DONOR HUMAN MILK

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Background: Human milk (HM) provides a source of microorganisms that seeds an infant's gastrointestinal microbiota. Increasingly, research suggests that this can impact both early and life-long health. However, only around 38% of over 500 microbes, detected by culture-independent methods, have been isolated in vitro. Furthermore, no obligate anaerobes have been cultured and isolated in HM, even though some have been detected by culture-independent methods. This has reduced our ability to study them under experimental conditions to better understand microbiota-microbiota and host-microbiota interactions.Recently, microbial culturomics has successfully isolated previously uncultured microbes from the human gut. Compared to the traditional culture method, culturomics consists of multiple culture conditions that mimic microbial natural habitats in the laboratory combined with the rapid identi#cation of bacteria. However, less research has focused on the low-biomass HM microbiota. Additionally, exposure to oxygen during sampling can be a major impediment to the success of culturing anaerobic microorganisms from human milk. Therefore, robust methods to collect, transport, and culture samples are vital to maximally isolate microbes from low biomass HM.

Methods: This study sought to develop a novel workflow from sample collection to culture to improve the isolation of as many microbes as possible from HM. An anaerobic pouch was tested for at-home sample collection and transportation anaerobically from participants to the laboratory. It was tested through the recovery of Bifidobacterium longum from ambiently stored samples in an anaerobic pouch, and anaerobic indicators. A culturomics workflow was designed to maximally create artificial microbial natural habitats in the laboratory. This included (1) 10-fold and 2-fold broad sample serial dilution; (2) liquid enrichment culture for fastidious microbes; (3) diverse culture broths and media, including non-selective, selective, and enriched; (4) broad culture atmosphere and temperature, e.g., aerobic, 5% CO2 aerobic, 8-10% CO2 microaerophilic, and anaerobic from 30-37°C; and (5) incubation duration from 3 to 14 days. The combination of different conditions was implemented into 96-well microplates for liquid enrichment and solid agar culture.

Results: The anaerobic pouch with gas generating sachet can successfully maintain an atmosphere which is beneficial for Bifidobacterium longum to survive for at least 72 hours. And anaerobic indicators results showed the anaerobic pouch can maintain an anaerobic atmosphere for at least 72 hours. The culturomics methodology was developed on glycerol stocks of frozen HM before being deployed for other types of collected samples, generating over 100 isolates and acquiring over 20 species by MALDI-TOF mass spectrometry identification, including aerobic, facultative and aerotolerant species.

Conclusions: The combination of the anaerobic pouch for sample transportation and the high-resolution culturomics in low-biomass microbial samples could be used to gain a broader understanding of the full range of microorganisms present within donor human milk, beyond the typical targets of Enterobacteriaceae and other potential pathogens. This may allow for greater evaluation of the potential benefit of preserving the microbial component of donor human milk that is currently removed through pasteurisation.

COD. OC 07

DONORS' MOTIVATIONS AND SOCIAL FACTORS INFLUENCING HUMAN MILK DONATION IN SELECTED EUROPEAN COUNTRIES

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Human milk banking (HMB) relies on generosity of breastfeeding (BF) women donating milk. However, little is known about the motivations and socio-economic factors influencing mothers' decision to become donors. In an era of suboptimal BF rates and high demand for donor human milk (DHM) for preterm infants, a better understanding of the variables involved in the decision to become a donor could allow better recruitment strategies.

This study explored BF mothers' motivations and social factors influencing their willingness to donate milk. The study draws on the results of 95 questionnaires collected from human milk donors in Poland, Italy and Netherlands between February 2020 and May 2022 as part of the interdisciplinary project "Health-promoting importance of human milk donation" founded by the Polish government. The response rate was 98%, and out of 97 participants of the study, we have collected 58 questionnaires from Polish donors, 26 from Italian donors and 11 from Dutch donors. The questionnaire explored socio-demographic characteristics of the donors, motivations that influence their decision to become a donor, and their experience with birth and lactation. The majority of questions were closed ended, either interval or ordinal. Some were open ended, or gave the opportunity for open ended answers. Both qualitative and quantitative analyses of collected data were performed.

We observed that human milk donors participating in our study were highly educated (67% holding tertiary education degree, with 8% holding a PhD degree), and financially well-situated (77% of those who responded to the question about income had medium or high 'buying power'). 98% of the participants were married or living with a partner. Majority of the respondents did not have any previous experience with human milk donation, whether direct (being donor before or receiving DHM from a DHB for their prior baby) nor indirect. In the sample, 40% respondents experienced preterm birth in their last pregnancy, with 58% of them being very or extremely preterm. In majority cases the child's condition after birth reported by mother was good (62%) or stable (26%). Having 'surplus of milk' was most often indicated as a reason to donate (59%), followed by the wish 'to help someone in need' (37%). The decision to donate was also reasoned by knowledge about human milk properties (17%) and by personal experiences (10%), such as preterm birth, baby's long hospitalisation and receiving DHM before. Interestingly, also among those participants with such experience, having surplus milk was most often indicated as a reason to donate.

Understanding social and cultural factors associated with this act can help us to better promote BF in general, as well as HMB. This study fills the gap in the literature regarding social factors influencing human milk donation and also contributes to the broader sociological study on motivation in donor population. Obtained results reveal a unique character of human milk that is both perceived as 'precious' and 'excess' at the same time, and provide data on the agency of human milk donors and the role of one's experience in terms of decision about donation.

COD. OC 08

THE COURSE OF MACRONUTRIENT CONCENTRATIONS IN HUMAN MILK DURING TWO YEARS OF LACTATION

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Human milk is dynamic in its composition to meet the changing needs of the growing child. For example, milk protein concentrations decrease during the first months of lactation. Unfortunately, there is a lack of knowledge on the macronutrient composition of human milk beyond 6 months of lactation. This knowledge may be important for preterm infants who receive donor milk when mother's own milk is insufficiently available. Currently, there is no consensus until when donors should be accepted at human milk banks during extended lactation, or whether their milk becomes nutritionally less suitable for preterm infants despite multinutrient fortification. This study aims to investigate whether the macronutrient composition remains stable during long periods of lactation.

This is a retrospective longitudinal cohort study performed with human milk samples from donors to the Dutch Human Milk Bank in the Amsterdam University Medical Center between December 2017 and June 2023. Donors were included if they had donated beyond 6 months of lactation. In all donated milk samples, concentrations of fat, protein, carbohydrates and the caloric density were routinely measured using a MIRIS® Human Milk Analyzer. We defined six different lactation periods (0-2months; 2-4months; 4-8months; 8-12months; 12-18months; 18-24months). Multiple samples from the same donor within each distinct period were averaged. The longitudinal results were statistically analyzed using linear mixed-model analyses, with time-variables created for different lactation periods.

In total, 748 samples from 64 woman were obtained. The mean gestational age was 38.1±3.7 weeks. Our results showed that the carbohydrate concentrations remain constant over the 2-years' period (8.4±0.4 g/dL). The fat concentrations started to increase from 8 months of lactation onwards (3.9±0.8 versus 3.5±0.6 g/dL during the initial 4 months, p=0.01), up to 5.3±0.1 g/dL (p<0.001) at 2 years of lactation. After 4 months of lactation, the concentrations of protein decreased (0.94±0.4 versus 1.1±0.1 g/dL during the initial 2 months, p=0.025), and this decrease continued up until 12 months (0.86±0.2 g/dL, p=0.005). After 18 months, we observed an increase in the protein concentration relative to the decrease in the first year of lactation (1.05±0.14 g/dL, p<0.001). Similar to the pattern of fat concentration, the energy content started to increase after 8 months of lactation (73±7.5 versus 69±6.4 kcal/dL during the initial 4 months, p=0.002), and continued to increase up to 2 years (87±8.4 kcal/dL, p<0.001).

Our findings suggest that throughout a lactation period up to 2 years the milk concentrations of carbohydrates remain stable, while the fat and energy content increases slightly over time, and protein concentration follows a U-shape with a nadir at 12 months postpartum. In summary, we demonstrated that the nutritional composition of donated human milk remains adequate for preterm infants during a lactation period up to at least two years, supporting the possibility of allowing mothers to donate their milk throughout the entire second year of lactation.

COD. OC 09

STUDY OF STEM CELLS IN HUMAN MILK DURING TRANSITION OF LACTATION

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Stem cells are undifferentiated cells with ability to self-renewal. Each mammalian species has a unique composition of milk that has developed during evolution to fulfil the requirements of their new-borns and infants. Breast milk contains stem and progenitor cells along with of immunological cells.
A Cross sectional, analytical, observational study was conducted after IEC approval. Healthy mothers delivered in the hospital were enrolled and breast milk samples were collected on day 1-2 (for colostrum), day 3-5 (for transitional milk) and day 6-7 (for matured milk) .Isolation, detection and differentiation of stem cells from preterm (<37 weeks),term (37 weeks to 41+6 days weeks) and post term milk (> 42 weeks) mothers was done. Total 30 mothers were enrolled by following inclusion and exclusion criteria of the study and written, informed consent.Study revealed abundant number of stem cells. The stem cell count was highest on day 2 and it starts to decrease from day 3 to 7. The mean stem cell count in the human milk on day 3 was 3.18 *105 while on day 5 mean cell count was 1.28*105 . Breast milk cells culture showed pluripotent mesenchymal stem cells with positive surface markers for CD 90, CD 105, and CD 73. The mesenchymal stem cells of human milk further differentiated into Adipogenic, Chondrogenic and osteogenic lineages. Other parameters of mothers were also observed. Breast milk contains abundant number of stem cells. The mean stem cell count in the human milk on day 2 was 3.81*10# while on day 7 mean cell count was 6 *10# The stem cell count was highest on day 2 and it starts to decrease from day 3 human milk samples to day 7 milk. Due to availability of highest number of stem cells in human milk on day 2, it can be use for setting Stem cell bank. There is relation between maternal ages with stem cell count on day 2, the cell count increases with mother's age but on day 4 and day 7 the cell count decreases with increase in maternal age. From the human milk stem cells culture mesenchymal cells were obtained. The mesenchymal cells were differentiated into Osteoblast, Chondrocyte, and Adipocyte.
Conclusions: This study provides base line data of availability and types of stem cells in mothers milk with encouraging results highlighting encouraging future in the field of stem cells .
Implications: Breast milk can become a potential source of stem cells as its isolation remains a simpler and less invasive technique. It can open avenues for stem cell therapies and Regenerative medicine.

COD. OC 10

PRESERVING NUTRITIONAL INTEGRITY: FREEZE-DRYING DONOR HUMAN MILK FOR EXTENDED COMPOSITIONAL STABILITY AT AMBIENT TEMPERATURES

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Introduction: Donor human milk (DHM) plays a crucial role in providing nutrition and immune support to infants who cannot receive their mother's milk. However, the current supply chain for DHM faces challenges, including nutrient degradation, limited shelf-life, and increased operational complexities. This includes relying on maintaining the cold chain, relying on volunteer couriers, and factoring in travel durations and weight loads. Non-profit and commercial milk banks have used freeze-drying techniques sporadically for several years, but limited knowledge exists on how this technique affects the composition of human milk.

Objective: This study investigated the efficacy of freeze-drying in preserving DHM composition and sterility. We aim to provide insights into the potential of freeze-drying as a viable alternative or supplementary technique to current processing and storage methods.

Method: This study was conducted using pasteurized DHM samples in partnership with Hearts Milk Bank (Human Milk Foundation, UK). The milk samples were subjected to freeze-drying under controlled conditions, and the resulting product was split into three different temperature categories (4°C, -20°C, and ambient temperature) over 5 time points (1,3,6,9, and 12 months). Freeze-dried samples were reconstituted with warm (37°C) sterile water, and evaluated for a range of parameters, including macronutrient content, microbiological sterility, and proteomic and metabolomic profiles. Comparative analyses were performed against baseline (0-time point) data, using GraphPad Prism 9.5.1. Metabolomic and proteomic profiles were examined via mass spectrometry techniques (REIMS and MALDI-ToF) and analyzed using univariate and multivariate statistical methods.

Results: Freeze-drying had no significant impact on the levels of fat, protein, carbohydrates, lactose, and salts in the DHM, which remained stable and unaffected by the freeze-drying process throughout the entire 12-month period at ambient temperature. Profiles of proteins and metabolites exhibited minimal variations across different temperatures and time points.

Discussion: The study's results provide strong evidence that freeze-drying effectively preserves DHM macronutrient levels while reducing the risk of microbial contamination. Freeze-dried samples exhibited extended shelf-life well beyond 6 months and their stability provides evidence to support translation into an active milk bank. By preserving nutritional composition and bioactive properties, freeze-drying may enhance health outcomes for preterm and otherwise vulnerable infants, as well as address the logistical challenges faced by milk banks, particularly during emergency responses.

Conclusion: This study has significant implications for the field of human milk banking. Implementing this technique ensures the availability of DHM. This research opens up new possibilities for preserving the nutritional integrity of DHM, even at ambient temperatures, and paves the way for improved access to vital nourishment for vulnerable infants.

COD. OC 11

THE STEROID PROFILE OF HUMAN MILK AND PASTEURIZED DONOR HUMAN MILK

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Introduction. Steroid hormones are part of the biologically active factors present in human milk (HM) as they may exert an influence on development of breastfed infants (e.g., body mass index (BMI)[1], temperament[2]). Besides, maternal psychosocial stress has been associated with changes in HM composition[3].

Aim. The aim of this work was to assess the steroid hormone profile of HM from mothers of term and preterm infants and from pasteurized donor human milk (DHM) and to assess whether maternal physical and psychosocial status have an impact on it.
Materials and Methods. A targeted ultra-performance liquid chromatography - mass spectrometry (UPLC-MS) method for the quantitation of seventeen steroid hormones in HM samples was developed in accordance with FDA guidelines. In the framework of the NUTRISHIELD study (https://nutrishield-project.eu/), HM samples from mothers of term infants (N=42) and preterm infants (N=35) at two different timepoints: (i)
recovery birth weight or complete enteral nutrition for term and preterm infants, respectively; and (ii) 6 months postnatal age were collected. Pasteurized DHM samples (N=19) collected at the Human Milk Bank of the Valencian Community (Spain) were also considered.
In addition, associations between physical and psychosocial status (e.g., lifestyle, Perceived Stress Scale (PSS-10), anxiety, and depression) of mothers, assessed through validated questionnaires, and their steroid profile in HM were evaluated.
Results. From the total panel of steroid hormones assessed, fourteen steroids were detected in at least one HM/DHM sample, with cortisol, 20β-dihydrocortisol, dehydroepiadrosterone, pregnenolone, and cortisone being present in more than 50% of the samples. Significantly lower median values in DHM samples for these latter steroids were found, what might be attributed to the pasteurization process. Interestingly, results from the stress assessment through the PSS-10 questionnaire revealed higher stress levels in donors than in mothers of term and preterm infants at 6 months of infant's age. No significant correlation between the steroid profile in HM samples and physical status (e.g., body mass index, physical activity) or the stress levels reported by the participants was evidenced.
Conclusions. Steroid hormones levels in HM are not directly related with maternal physical and psychosocial status. The pasteurization process has likely an effect on the steroid hormone levels in HM, what might have an impact on the development of receptors.

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Acknowledgements

This project was funded by the ISC III [CD19/00176; CM20/00143; CPII21/00003], grant CNS2022-135398 funded by MCIN/AEI/10.13039/501100011033 and, as appropriate, by "European Union NextGenerationEU/PRTR, Generalitat Valenciana (GV/2021/186), and the Nutrishield study (H2020, grant agreement 818110).

COD. OC 12

VEGAN/VEGETARIAN DIET AND HUMAN MILK DONATION: AN EMBA SURVEY ACROSS EUROPEAN MILK BANKS

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The nutritional adequacy of human milk (HM) from vegan/vegetarian mothers has been a matter of debate, and a variety of recommendations regarding the eligibility of these mothers as human milk donors exists. According to the latest evidence, HM from vegans/vegetarians is similar in its composition to that from omnivores, however some differences may be observed regarding vitamin B12 and omega-3 fatty acids concentrations. Maternal supplementation of these compounds has been proved effective in increasing their HM concentration. With this survey, we aimed to explore the practices currently in use in European human milk banks (HMBs) regarding potential donors following vegan/vegetarian diets. The online survey was distributed to European HMBs between January and July 2022. A total of 188 HMBs were contacted, and 118 replied (response rate 63%). Vegan and vegetarian mothers were recommended supplements of vitamin B12 to be accepted as donors in 27% and 26% of HMBs, respectively. Additional omega-3 fatty acid supplementation was required in 8% HMBs. In the remaining HMBs, these mothers were either systematically excluded or
included regardless of supplementation. Dosage of recommended supplements was extremely variable. 51% HMBs were following recommendations to guide their practice, national or local recommendations mainly. Great variability in European HMBs practices towards potential donors following vegan/vegetarian diets exists. Some of these practices can result in loss of donors and/or in potential nutritional deficiencies. Standardised evidence-based recommendations on this issue, and their implementation in daily HMB practice, are needed.

COD. OC 13

SETTING UP THE FIRST HUMAN MILK BANK IN UGANDA: A SUCCESS STORY FROM ST. FRANCIS HOSPITAL NSAMBYA

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Background: The World Health Organization (WHO) strongly recommends the use of donor milk in absence of mothers for low birth weight. However, the use of donor milk requires the availability of human milk banks (HMBs), the majority of which are in high-income countries. Developing countries offer multiple opportunities and challenges regarding the set up and operationalization of HMBs, this study describes the experience in setting up the HMB in Uganda at St. Francis Hospital Nsambya.

Methods: The set-up of the first HMB in Uganda followed a step-wise approach using the PATH integrated resource tool Kit. The steps included facility readiness assessment, implementing quality control measures, forming and training a committee for the Baby Friendly Hospital Initiative, establishing a monitoring and evaluation system, developing a communication strategy, engaging with the Ministry of Health, providing staff training by a Human Milk Bank consultant, and maintaining regular coordination by a dedicated technical team.

Results: The St. Francis Hospital Nsambya HMB was established in November 2021. A total of 170 Donors screened, of these 140 have donated milk with a mean age of 26 years. A total of 109 neonatal infants have received the milk, majority 96/109 (88%) are preterm infants with a mean gestational age of 34 weeks. A total of 90 liters has been collected and 76 distributed.

Assessing the experiences and attitudes of mothers, donors, healthcare providers, and hospital leaders revealed concerns about milk safety and potential attachments or acquired traits. Donors viewed milk donation as a life-saving act, although fears of breast cancer and lumps arose from misconceptions. To address these perspectives, creative media, such as videos and messages, were designed to raise awareness, promote behavioral change, and create demand for the HMB services.

Conclusion: The set-up of HMBs at hospitals in Uganda is feasible. St. Francis Hospital Nsambya has laid the ground work for the process. On a positive note, there is a substantial number of willing donors, however, challenges such as safety concerns and misconceptions regarding milk donation were also encountered. To overcome these challenges, creative media and awareness campaigns were designed to promote behavioral change and generate demand for HMB services.

COD. OC 14

WORKING GROUP ON DRUGS AND BREAST MILK DONATION

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INTRODUCTION

The proper selection of breast milk donors to a milk bank is a key element in the safety of the process. Drug use can be a reason for temporary or permanent exclusion. There is little evidence available to base the decision of accepting these mothers as donors and much variability in clinical practice and in published guidelines. With the aim of reducing this variability and improving safety, a Working Group on Drugs and Breast Milk Donation (WGDBMD) was created within the framework of the SPANISH ASSOCIATION OF HUMAN MILK BANKS.

OBJETIVE

To describe the work carried out by the Working Group on Pharmaceuticals and Breast Milk Donation MATERIAL AND METHODS Systematic review of groups of drugs considered of interest for donation due to the frequency of their use in the population of female donors or due to their pharmacological characteristics.

RESULTS

The WGDBMD is a multidisciplinary group made up of neonatologists, pharmacists, paediatricians, chemists and nurses working in the field of milk banks and neonatology. 323 drugs have been reviewed by 2 reviewers, classifying them as compatible or incompatible with donation based on their pharmacokinetic and pharmacodynamic characteristics, and considering the characteristics of the recipient patients. In case of disagreement in the assessment, it was reassessed by a third professional. This work has made it possible to draw up a list of 195 compatible drugs and 128 incompatible drugs available to all AEBLH members.

CONCLUSION

The availability of this review's results has reduced the variability in the selection of donors for this reason , increasing the safety of the process.

COD. OC 15

BRIDGING THE SWISS MILK GAP: A ONE-YEAR REVIEW AFTER CREATING THE FIRST HUMAN MILK BANK AND BLOOD BANK MODEL IN SWITZERLAND

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Context. Donor human milk (DHM) from a human milk bank (HMB) is unanimously recognized as a standard of care for at-risk infants when their mother's own milk (MOM) is limited. Despite this global consensus, equal and adequate access to this reference treatment remains a major challenge. Prior to 2022, 8 HMB were established in Switzerland. None, however, were in the Western French-speaking regions. Swiss HMB are managed separately at the hospital-level, vary widely in scope and practice, and lack national policies. In 2021, 7.4% of 89'000 live births were preterm in Switzerland. Among the 800-1'000 very preterm infants, only half received DHM (n=469), none of which were from Western Switzerland, despite the region accounting for 25% of the national births. As the legal status of human milk (HM) remains undefined, further scale-up of HMB has been hindered by the absence of a national program to ensure access to DHM. To address these gaps and respond to the critical needs of at-risk neonates, the aim of the project was to establish an innovative, safe, equitable and sustainable HMB model at the University Hospital of Lausanne (CHUV).

Methods. A central element of the HMB project was the partnership, which merged the complementary resources, infrastructures, and expertise of two organizations:
•The Clinic of Neonatology, CHUV, specialized in newborn care and nutrition with a NICU Breastfeeding Support Unit;
•The Interregional Blood Transfusion of the Swiss Red Cross, experts in donation management, collection, analyses, treatment, quality, and safety of biological products.
The synergies of both institutions sparked the creation of a unique HMB-blood bank association, which emphasized safety, quality and traceability throughout the entire process. Interdisciplinary expert groups elaborated evidence-based procedures while respecting national and international recommendations and good manufacturing practices.

Results. After 2.5 years of development and support from the State of Vaud Department of Public Health, the CHUV Lactarium launched in May 2022 and became the first HMB-blood bank model in Switzerland. After 6 weeks of operations, the Lactarium ensured a sufficient supply and scaled-up to offer pasteurized DHM to all neonates, <32weeks GA and/or <1,500g, and those with certain complications. After 1- year, the Lactarium received >300 HM donation propositions, qualified 60 donors, coordinated the collections, microbiological analyses, processing, storage, and distribution of 200 liters of pasteurized DHM to 150 neonates with medical indications, covering 100% of cases when MOM was limited. As a complement to breastfeeding support initiatives, 80% of DHM recipients bridged towards receiving exclusive MOM, which remains priority.

Conclusion. Among the few pioneers in Europe, the CHUV Lactarium is the first HMB-blood bank association in Switzerland. Through a complementary and interdisciplinary partnership, the project achieved to design a quality, safe and sustainable model. The CHUV Lactarium reenforces breastfeeding support and contributes to improving HM feeding monitoring and outcomes. This solution bridges a gap and offers an innovative model to respond to the needs of at-risk newborns, their families, and the population. The CHUV Lactarium is well adapted to face anticipated changes to national and/or European regulatory frameworks.

COD. OC 16

TRACKING OF HUMAN MILK FEEDING IN THE NICU: GAPS IN CLINICAL PRACTICES AND POSSIBLE SOLUTIONS

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Consuming mother's own milk (MOM) is recognized as the gold standard for newborns and save lives. Need to protect breastfeeding and promote the use of human milk as an essential health intervention. Mothers of preterm infants face many obstacles. It is possible to achieve high rates of any Breast Milk Feeding at discharge after very preterm birth. Collecting the key lactation and infant feeding metrics will help to develop standards of care that support mothers in their lactation journey and improve infant outcomes. Collection of feeding data (including amounts) by milk composition—MOM, donor human milk, or formula. National Spanish database collection extension proposal. The emergence of mobile technology has opened new ideas for health management. Mothers using the model of online lactation education were able to maintain a sufficient pumping frequency to achieve sustained growth in milk volume, most mothers achieving milk production 500 ml/d by day 14. Personal conclusions: 1. Limitations in using Ever received HM during the NICU hospitalization and Human Milk Feeding at NICU Discharge as the only quality indicators for evaluating the use of HM for VLBW infants in the NICU; 2. The average daily dose in mL/kg/d and cumulative percentage as % of cumulative enteral intake of MOM feedings are sufficient to explain the reduced risk of multiple morbidities, including late onset sepsis, necrotizing enterocolitis, neurocognitive delay and rehospitalization, in the majority of the VLBW infants; 3. These quality indicators that focus on the amount of OMM feedings in the NICU should be incorporated.

POSTERS

COD. P 01

URINARY METABOLOMIC DIFFERENTIATION OF INFANTS FED ON HUMAN BREASTMILK AND FORMULATED MILK

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Human breastmilk is an invaluable nutritional and pharmacological resources with highly diverse metabolite profiles, which can directly affect the metabolism of infants. Application of metabolomics can discriminate the complex relationship between such nutrients and infant health. As the most common biological fluid in metabolomic study, infant urinary metabolomics may provide the physiological impacts of different nutritional resources, namely human breastmilk, and formulated milk. In this study, we aimed to identify possible differences in the urine metabolome of 61 infants (1-14 days after birth), fed with breast milk (n=30) or formulated milk (n=30). From untargeted metabolomic analysis with gas chromatography-mass spectrometry, total 400 metabolites were confirmed in urinary samples. Various multivariate statistical analyeses were performed to discriminate the differences originated from physioogical/nutritional variables, including human breastmilk/formulate milk feeding, sexs, and duration of feeding. Both unsupervised and supervised discriminant analyses indicated that feeding resources (human breastmilk/formulate milk) gave marginal but significant differences in urinary metaboloms, while other factors (sex, duration of feeding) did not show notable discrimination between groups. According to biomarker analyses, several organic acid and amino acids showed statistically significant differences between difference feeding resources, namely 2-phosphoglycerate and 2- hydroxyhippurate. This study was researched with the support of the National Research Foundation of Korea with funding from the government (Ministry of Science and ICT) in 2020 (No.2020R1A2C1005082)

COD. P 02

FACTORS INFLUENCING THE SUSTAINABILITY OF HUMAN MILK DONATION TO MILK BANKS: A SYSTEMATIC LITERATURE REVIEW

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Background
Every year, around 500'000 vulnerable infants born before 32 weeks lack access to donor human milk from milk banks worldwide. Major challenges towards efficient and sustainable milk banking systems include milk banks' implementation, organisation, cost (-efficiency) and policies. Little research is available to inform how to sustain and increase human milk donation. This PhD thesis will investigate key factors influencing the sustainability of human milk donation to milk banks. A mixed-methods design will investigate donation sustainability at macro level (policy and guidelines), mezzo level (milk banks stakeholders) and micro level (milk donors). Here, we present the results of the first step (out of five) of this PhD project.

Objectives
To conduct a systematic literature review to identify factors that influence the sustainability of milk donation to human milk banks.

Methods
The study protocol and details of the search strategy are registered and available on PROSPERO (#CRD42021287087). The systematic review included eight databases and retrieved articles published until December 2021. The literature selection was conducted by two authors through COVIDENCE based on defined inclusion and exclusion criteria. The quality assessment of the articles was performed using the critical appraisal skills program (CASP) qualitative checklist and the checklist of the National Heart, Lung, and Blood Institute for cross-sectional and cohort studies. Data were extracted with an adapted version of the standardised data collection form from the Cochrane Developmental, Psychosocial and Learning Problems Review Group. Evidence was assessed with the Grading of Recommendations, Assessment, Development, and Evaluations (GRADE) and the CERQual GRADE tools. Finally, narrative syntheses included the qualitative and quantitative literature analyses.

Results
From the 6722 references identified, 10 articles were included; two qualitative and eight quantitative studies with 7'053 participants in five countries. The quality of the studies were assessed as variable (two weak, three moderate and five good). Thirty factors were identified as influencing the sustainability of donations to milk banks. These were categorised as: (1) Donors (socio-demographic characteristics, motivation, donation history and duration), (2) Donor's infant health (gestation, birth weight, growth), and (3) Milk bank factors and systems (awareness and support). Most factors cited were at a micro level (individual, donor's level), few were at a mezzo level (milk bank level), and none were at a more macro level (health care system, milk banking system, policies, guidelines). The evidence suggests that sustainable milk donations are associated with repeat donors, longer periods of donation, and with donors whose infant was of smaller gestational age and/or weight.

Conclusions
Available research suggests that supporting and encouraging early and repeat donation and recruiting donors with infants of low birth weight and gestational age may increase volumes of donor human milk. This review also highlighted the scarcity of the literature on sustainability, demonstrating the need for more research, specifically to identify sustainable factors at both mezzo and macro levels.

COD. P 03

BRIDGING THE DIVIDE: REGULATING HUMAN MILK BANKING AND INFORMAL MILK SHARING AS PART OF RESILIENT BREASTFEEDING SYSTEMS

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Introduction:
The regulation of human milk banking employs diverse frameworks for food, human tissue and therapeutic goods of human origin, and questions remain about safety, access and ethics, including international trade in human milk and milk products. In most countries, regulatory attention has focussed on donor human milk obtained through milk banks for use under medical supervision, and the role of milk banks in breastfeeding systems or a wider 'bioeconomy' remains unclear. Important regulatory issues include how to avoid capturing a mother's own milk, and uncertainty about donor milk shared informally among mothers' networks. Milk banks typically distance themselves from informal milk sharing practices, because of potential safety, reputational and business risks, but this may appear inconsistent with recommendations for exclusive breastfeeding and creates deep divisions between milk sharing 'sectors.' This paper reports on empirical research that aimed to investigate how milk banking and informal milk sharing can be regulated synergistically, in ways that promote, protect and support breastfeeding.

Methods:
This research used a broad definition of 'regulation' to encompass legal and social rules, and factors that shaped the individual and institutional conditions under which human milk was shared. Using Australia as a case study, regulation of different milk sharing sectors in health and community settings was investigated from 2011-2023, through a qualitative study of relevant laws and policies, and semi-structured interviews of 95 key informants (mothers, milk banks, health professionals and policy makers). Data were analysed using In-Vivo and coded using approaches based on regulatory concepts of power ('nodal governance') and individual agency (the AMPR behavioural model).

Results:
Australia was an ideal location to undertake this research, with a new, self-regulated milk banking sector and an active altruistic informal milk sharing sector operating in a fragmented federal political system. Since 2006, milk banking has undergone rapid expansion and consolidation, following the entry of a blood bank into milk banking, requests to import commercial donor milk, and the emergence of local start-up companies to use novel milk processing technologies. However, inadequate societal investment in breastfeeding and weak implementation of the WHO International Code of Marketing of Breastmilk Substitutes cast milk sharing as part of a problem rather than a solution for improved infant feeding. The analysis revealed an incoherent legal framework for milk sharing, lack of coordinated governance of milk banks, compromised positions of health professionals and blurred boundaries between milk sharing practices. This arose because human milk was regulated as a product, rather than a result of a spectrum of practices which were part of women's processes and systems for maintaining breastfeeding.

Conclusions:
To support breastfeeding, authorities should ensure that breastfeeding mothers and their relationships are central to designing governance of milk banking and informal milk sharing. The evidence from this study support shifting attention from regulating human milk as a product, to designing suitable governance structures for all forms of milk sharing. This is essential to embed milk sharing to meet the needs of infants and mothers in specific circumstances within resilient breastfeeding systems.

COD. P 04

EMBEDDING HUMAN MILK BANKING WITHIN A COMPREHENSIVE NEWBORN NUTRITION PACKAGE OF CARE FOR THE SMALL AND SICK NEWBORN

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Globally momentum around optimizing care for the small and sick newborn (SSN) is increasing as a strategy to reduce neonatal mortality especially in high burdened regions. Human milk is recommended as a critical component for optimal care for SSN. The 2022 WHO Recommendations for the Care of the Preterm or Low-birth-weight Infant states that mothers' own milk is the recommended option for feeding low-birth-weight infants, however, when this is not an option or insufficient, donor human milk is the preferred next option before infant formula. Yet provision of human milk for SSN requires addressing critical challenges facing both the infant and the mother.

In December 2021, PATH was invited to participate in a WHO and UNICEF global consultation meeting on "Developing a Model of Inpatient Care for SSN". PATH presented challenges that have resulted in barriers to operationalizing exclusive human milk diets. These include lack of data on how SSN are fed; lack of specialized lactation support in neonate ward settings; lack of alignment of newborn and nutrition policies and programming; lack of human milk bank (HMB) expansion to high burdened LMIC settings; and critical care settings that limit mother-infant contact or access. Additionally, despite global standards promoting human milk diets for SSN, operational guidance for how to implement this is lacking. PATH advocated for a systems level change and that a comprehensive newborn nutrition package of care must be a prioritized component with a model of care for SSN. This must include interlinked multi-faceted components, including the following: 1) Readiness assessment to document current feeding and lactation practices, inform planning and HMB requirements; 2) curriculum development and accreditation to address gaps in NICU clinical staff through standardized curriculum focusing on specialized lactation and HMB; 3) training and capacity building to operationalize improvements in pre- and in-service knowledge, practice and training gaps; 4) quality improvement to ensure standardized, safe and quality systems are utilized, tools are developed, mentorship and real-time assessments are provided; 5) cross learning to facilitate sharing across settings, regional centers of excellence, especially where new services are not yet available in-country for learning; 6) evaluation to generate evidence on the operations and impact of an integrated newborn nutrition program; 7) innovation to co-design country-led innovative solutions to improve quality, efficiency, and access of human milk feeds to drive feasible uptake in LMIC settings; and 8) HMB implementation and integration to establish robust, safe, locally-appropriate, locally-led, sustainable, HMB systems embedded within newborn and nutrition programming to achieve exclusive human milk diets.

In line with the 2022 WHO recommendations calling for implementation research on establishing HMB feasible HMB systems in LMIC settings, PATH called for the specific needs of SSN and their mothers to be addressed with targeted interventions. Country-led innovation is needed to inform and guide context-appropriate models of care – including embedding HMB within a comprehensive newborn nutrition package of care.

COD. P 05

UNDERSTANDING THE ROLE OF XANTHINE OXIDASE AND LACTOPEROXIDASE IN NEWBORN INNATE IMMUNITY

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'Innate immunity' in newborn mammals, including human babies, is the first line of defence against the wide spectrum of disease-causing microorganisms to which newborns are exposed during early life, before the development of 'adaptive immunity' (T/B-cells and antibodies). Two enzymes in breastmilk, xanthine oxidase (XO) and lactoperoxidase (LPO), are important components of innate immunity, because they generate reactive oxygen and nitrogen molecules that can kill microorganisms. These 'oxidative molecules' include hydrogen peroxide, hypothiocyanite, nitric oxide, and peroxynitrite. XO is a major generator of hydrogen peroxide that subsequently triggers a cascade of other oxidative species, including those produced by LPO, which have bactericidal and bacteriostatic effects. XO is known to be active within the mammary glands, using its substrates hypoxanthine and xanthine to produce bacteriostatic molecules to inhibit infections, but XO substrates are exhausted when milk is expelled. We asked: Is XO re-activated during breastfeeding? We showed that when breastmilk mixes with baby saliva during suckling, XO is activated by hypoxanthine and xanthine that are uniquely present in baby saliva, to produce peroxide. In turn, peroxide may activate LPO to produce antibacterial agents. We demonstrated that mixtures of baby saliva and breastmilk inhibit 'opportunistic pathogens', such as Staphylococcus aureus and Streptococcus species, while saliva-breastmilk mixtures were tolerated by beneficial 'commensal bacteria', such as Lactobacillus. Our work thus revealed that the complex biochemical interactions of infant saliva with breastmilk constitute an unrecognised element of innate immunity of infants.We realised, however, that the flux of oxidative ('redox') compounds through the XO-LPO pathway in milk has remained unclear. Hence, we asked: Is innate immunity provided by peroxide, or by other redox molecules? Using novel real-time assays, we measured the flow of redox compounds through the XO-LPO pathway in milk, under physiological conditions. Our results contradicted previous assumptions. The oxidative compound hypothiocyanite was found to be the major redox molecule, with high concentrations produced that remained stable for several hours, potentially allowing it to exert its antibacterial effect into the gut of newborns. In contrast, peroxide concentrations remained too low, because of its high flux into LPO, to exert an antibacterial action. Inhibition of LPO was not observed at these physiologically low peroxide concentrations, contradicting previous assertions. Thus, hypothiocyanite, derived from thiocyanate, a common chemical in baby saliva but not in milk, is another essential aspect of breastfeeding. Finally, as the early mammalian immunity by redox action relies on biochemical symbiosis between mother and baby, through milk-saliva interaction, we then asked whether the common practice in breastmilk banks of heating donor breastmilk for 'Holder pasteurisation' may affect the innate immunity provided by XO and LPO? We developed highly sensitive micro-plate fluorescent assays to determine XO and LPO activities in milk samples. We found that the XO and LPO activities in breastmilk are drastically reduced by Holder pasteurisation. We, therefore, suggest that it is important to consider the fate of oxidative enzymes during the pasteurisation of donor breastmilk, and the role of thiocyanate.

COD. P 06

EXPERIENCE IN THE EXCHANGE OF DONATED MILK BETWEEN HUMAN MILK BANKS

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The activity of Human Milk Banks (HMB) can be occasionally altered by changes in the volume of donated human milk received or by variations in the demands of the Neonatology Units. Storage problems can be generated, difficulties to process the donated human milk at optimal times, difficulties in meeting the requests of the receiving Units, expiration of frozen pasteurized milk due to low demand...

AIM

The objective is to design a transport system for donated human milk (unprocessed or pasteurized) between milk banks, with the maximum guarantees of safety and quality control, ensuring the traceability of the procedure and the transfer of information.

MATERIAL

Polyspan refrigerators compartmentalized with a capacity for 22-33 liters and an isothermal container (Ozti) with a capacity for 72 Liters were used. Dry ice for temperature maintenance.
Temperatures record during the transport TESTO model 174-T.
Informatic support: software for the transfer of all the information related to transported donated milk.

RESULTS

In the period from 26 april 2023 to 23 june 2023, a total of 6 transfers of unprocessed and pasteurized human milk were made from a Human Milk Bank to three others Banks. A total of 99.144 liters of donated human milk (69.36 L unprocessed and 29.84 L of pasteurized human milk) were transferred.
HMB 1 located 203 Kms received 3 shipments. A total of 27, 47 liters of unprocessed human milk and 10,18 liters of pasteurized human milk.
HMB 2 located 248 Kms received 1 shipment. A total of 26,65 liters of unprocessed human milk.
HMB located 277,3 Kms received 2 shipments. A total of 15,24 liters of unprocessed human milk and 19,66 liters of pasteurized human milk.
The average temperature of the refrigerators upon delivery to the recipient human Milk Bank was -19.4ºC (-16.9ºC- 22ºC).

CONCLUSIONS

The exchange of unprocessed or pasteurized donated human milk between HMB is possible, with the design of a transport system that guarantees the maintenance of the cold chain and thermal control of the entire procedure.
It is essential when exchanging milk between banks, to have a software that allows the maintenance of unit traceability, without having to register data in the receiving bank. In this way, errors and the additional work that would entail reintroducing information that already exists in the source milk bank will be avoided. Having a software that manages the sending of information about donors, procedures and controls guarantees the traceability and security of the entire procedure.
The exchange of donated milk between HMB improves their activity and makes it possible to maintain and even increase the number of newborn recipients.

COD. P 07

COMPOSITION OF BACTERIAL MICROBIOTA OF DONATED HUMAN MILK

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Introduction
Previous research has proven the correlation between the bacterial diversity of human milk and different characteristics of the mother, the
child and the milk. Bacteria from the genera Bifidobacterium and Lactobacillus and other lactic acid bacteria (LAB) which act as probiotic
bacteria are effective in the prevention of necrotizing enterocolitis (NEC), for which premature children are especially susceptible. There
is not enough data on the presence and representation of bacterial microbiota in donor human milk (DHM).

Objective
The aim of the research is to identify the presence of certain bacterial genera within DHM, with an emphasis on LAB.

Materials and methods
Archival samples from pools of raw donated milk expressed in the first 6 months after birth from 88 donors were included in the research. The samples met the microbiological quality requirements for clinical use- ≤105 colony forming units (CFU) of total bacteria/mL and within that Staphylococcus aureus ≤104 CFU/mL and Entereobacteriaceae ≤104 CFU/mL. Two groups of samples were compared- those of donors who gave birth vaginally and were not exposed to antibiotics in the previous 6 months (N=53) and samples from donors who gave birth by caesarean section or vaginally, but were exposed to antibiotics in the previous 6 months (N=35). Data from the human milk bank records were collected on donors, their children and milk characteristics. Additional anaerobic cultures were made on selective media for LAB. Bacterial deoxyribonucleic acid (DNA) was isolated from the DHM samples and hypervariable region V1-V3 of the 16S ribosomal RNA (rRNA) gene was amplified. Next generation sequencing (NGS) was performed on Illumina platform and data on nucleotide sequences within the V1-V3 region were analyzed to obtain a taxonomic classification of bacteria within the samples.

Results
Staphylococcus is the most represented genus, present in all analyzed samples, in a percentage from 0.5 to 88 %, followed by genera Streptococcus, Burkholderia, Acidovorax, Ralstonia, Enterobacter, Lactobacillus, Acidithiobacillus, Klebsiella and Enterococcus. Lactobacillus was also present in all samples, in a percentage from 0.06 to 62%. Bacteria from genera Bifidobacterium were present in 62 (70%) of samples, in smaller relative percentage, with the largest within one sample being 3.6%. By comparing the groups of donors who were exposed to antibiotics and those who were not, no statistically significant difference was found according to the presence of LAB (p=0.128 for Lactobacillus, P=0.152 for Bifidobacterium) A comparison of other characteristics of mothers, children and milk with the representation of bacterial microbiota is ongoing.

Conclusion
According to the data processed so far, no correlation was found between the presence of LAB and the characteristics of milk donors. A better knowledge of the microbiota of DHM could be significant in the nutrition of the most vulnerable group of children. Maternal or raw DHM of a certain bacterial composition could be used in the future to restore the desired microbiota of pasteurized milk with the aim of personalized nutrition.

COD. P 08

ESTABLISHMENT OF A DONOR-, RECIPIENT-, AND ENVIRONMENT-FRIENDLY HUMAN MILK BANK: THE 5-YEAR EXPERIENCE OF TAIWAN SOUTHERN HUMAN MILK BANK

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Background

Establishment of human milk bank is essential for improving neonatal care. Banked human milk plays one important role in the transition period of newborns to support them to be exclusively human milk (HM) fed. Under a twenty thousand USD annually govern-support budget, Taiwan Southern Human Milk Bank (TWSHMB) has been developed since early 2018 and has been assigned to process two millions milliliter raw donor hum milk (DHM). For donors, TWSHMB initially set up a policy “early participation and long-term donation". Volunteer donors are recruited within their first three months of post-partum age and, if qualified, can donate as long as their will. Donors are served non-incentively by a single case manager, a small in-house freezer, unlimited numbers of sterile glasses bottles for collecting milk and replacing plastic milk-collecting bag, and a door-to-door transport service between TSHMB and the house. Bacteriology of raw DHM, if failed to pass the test, are reported to donors to secure the health of the donor's children. For recipients, TWSHMB aimed to timeless and gapless to serve the applicants of DHM. Under medical orders, recipients with qualified criteria could apply and reach the pasteurized DHM through multiple channels. TWSHMB developed channels, including personal applicants— get DHM onsite to go, hospital-based proxy stations—TWSHMB shipped a batch DHM to a proxy hospital for each applicant, mini-distribution points— medical staffs independent issues in-house DHM by a one-bottle-one-patient rule, and a distribution unit affiliated with TWSHMB—DHM issued by a one-bottle-multiple-patient rule through a computer system. For tracing the applicants, the informed consents were all sent to TSHMB and registered with minimal information, including the criteria of DHM, the gestational age, and the birth body weight. This study aimed to analyze the performance data of 5-year TWSHMB.

Material and methods

This retrospective study collected data registered in the electronic system from April 2018 to 2023 March. Donor The outcomes included the personal donated volume and duration of donors, the number of recipients, and the utilized volume by gestational age and body weight. Data were analyzed and processed by SPSS V28.

Result

In the past 5 years, TSHMB served more than 375 donors with a fine case management protocol. In average, each donor provided 30 liters in each cooperation, and TSHMB processed 2,500–3,000 liters donor milk per year. Since TSHMB supplies sterile glass bottles door by door for donors collecting breast milk. This economic and environmental friendly system replaced more than 30000 milk storage bags. The pass rate before or after pasteurization was averaged 98%. TWSHMB has supported one distribution unit, developed 12 mini distribution points, and connected with 10 proxy stations. In average, annually TWSHMB continues to serve more than 600 infants every year. Of recipients, there was 52.5 % are term infants. However, 94% of passed-test HM was used in preterm infants.

Conclusion

TWSHMB successfully develops a donor-, recipient-, and environment-friendly system. The operation model may provide an idea for newly planned human milk banks.

COD. P 09

IMPACT OF A DONATED MILK BANK ON NEWBORNS WITH CONGENITAL HEART DISEASE: A RETROSPECTIVE COMPARATIVE ANALYSIS

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Introduction: Newborns with congenital heart disease (CHDs) may develop enteritis and enterocolitis, attributed to intestinal ischemia from hemodynamic changes associated with heart disease or post-surgical interventions, sometimes involving extracorporeal circulation. These conditions may delay enteral feedings. Human milk is the optimal nutrition for these patients, in the event of its unavailability, artificial formula would be used. The specific impact of a donated milk bank on these patients remains unexplored.

Objectives: The primary objective was to analyze the incidence of enteritis and enterocolitis in newborns with CHD who underwent surgical intervention in a level IIIC neonatology unit during two distinct periods: pre and post a donated milk bank. As secondary objectives, we aimed to assess the percentage of patients receiving breast milk during the immediate postoperative period and at discharge, determine the age at which exclusive enteral and oral feeding was achieved, and evaluate the total duration of stay in the neonatal intensive care unit (NICU).

Methods: Retrospective review of neonatal patients with CHDs with compromised systemic flow, who underwent extracorporeal surgery within the neonatal period. We included a total of 195 patients, 99 from 2009-2013 to a period without milk bank (Group 1) and 96 from 2017-2021 to a period with donated milk bank access (Group 2). Incidence rates of enteritis and necrotizing enterocolitis, types of feeding before and after surgery and at discharge, time to achieve full enteral and oral feeding, and NICU/total days of admission were analyzed for both groups.

Results: Both groups were similar in sample size, gestational age, weight, age at surgical intervention, and type of CHD. Results related to Group 1 vs Group 2 were: Enteritis and NEC were: 7%- 11% vs 3%-3% with no significant differences (ns). Days to reach enteral exclusively enteral feeding and oral feeding were: 31-34 days vs 26-28 days (ns). Breastfeeding post-surgery and at discharge: 56%-30%
vs 83% -56%; Days admitted at NICU and Total admission: 22-37 vs 26-36 days. Significative fewer days on NICU p=0.021 were found. Conclusion: Access to donated human milk for patients with congenital heart disease, even without statistical significance, is associated with a lower incidence of enteritis-enterocolitis, an increase in breastfeeding rates globally and allows achieving complete enteral feeding up to 5 days before. More studies are needed to confirm this trend.

COD. P 10

NETWORK OF HUMAN MILK BANKS IN THE ISLAMIC REPUBLIC OF IRAN

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Human milk banks (HMBs) facilitate the collection, processing, and distribution of donor human milk. Currently, more than 750 HMBs exist in over 65 countries, with the vast majority situated in North America, Brazil, and Europe(1). The first Human Breast Milk Bank in Iran was established at Al-Zahra Teaching Hospital of Tabriz, affiliated with Tabriz University of Medical Sciences (TUOMS), in 2016.
After establishing the first milk bank in Tabriz, the result of a study showed that launching the human milk bank significantly improved the outcomes of premature infants(2)so the Ministry of Health, and Medical Education (MOHME) decided to extend the number of breast milk banks in the country . We established a knowledge-based company at TUOMS to investigate the structure of human milk pasteurizer machines and manufacture it in Iran. Resultantly, Matin Promoter of Breast Milk Bank Co. successfully manufactured the machine received the necessary national certificates after technical evaluation, and commercialized the machine.The number of milk banks gradually increased and reached eleven in 2022 with financial and logistic support from the (MOHME). They were located in: Tehran (the capital city of the country has two), Tabriz, Mashhad, Yazd, Isfahan, Kerman, Kermanshah, Ahvaz, Zahedan, and Shiraz. There are no privately operated human milk banks in Iran. The eleven operating milk banks work as a network. The registration system of the Neonatal Office of MOHME collects data from milk banks .During the year 2022, the Human Milk Bank of Alzahra Teaching Hospital in Tabriz had 87 donors and pasteurized 1,754 liters of breast milk for 733 infants manly preterm who were admitted to nine different hospitals in the province.Milk kinship is an Islamic belief, unlike many mothers in some Islamic countries (3), most mothers in Iran are interested in donating milk and have no problem with accepting milk for infants . In Iran, where 98 percent of the population is Muslim, 89 percent are Shi'a and 9 percent are Sunni. Non-Muslims are estimated to account for 2 percent of the population.Based on Shia principles for forming milk kinship, the following conditions are necessary: the infant should be breastfed at least fifteen times or be breastfed one complete day and night, or be breastfed in an amount that can be said to have strengthened their bones and flesh. Breast milk should be suckled directly from the breast, and feeding by spoon or NG Tube is not compatible with mahram rules. The milk should not be mixed with anything else. These conditions will not apply to donated milk in breast milk banks. To well define milk kinship or forming mahram illusions, a permission letter
was also obtained from the current Supreme Leader of Iran. For some parts of the country with a Sunni population, our approach is receiving milk from a single donor for only one recipient infant, which makes it easier to trace milk relationships. Additionally, the donor and recipient parents meet before the exchange, similar to the approaches used in Kuwait and Indonesia's milk banks (4).

COD. P 11

DOES BREAST SIZE AFFECT HUMAN MILK MACRONUTRIENT COMPOSITION?

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Objectives
Numerous scientific studies show that women differ significantly in the composition of milk, and these differences are related to the style of feeding (e.g. frequency of feedings), their body adiposity, or diet. Several studies have also reported that milk composition may be associated with parity, maternal age, infant sex, and size. Although the primary function of a woman's breast is milk synthesis, to this date only a few studies evaluated the relationship between breast size and human milk composition on a small sample size showing equivocal results. Since the composition of breast milk affects infant development, it is crucial to identify all potential factors affecting breast milk production. Therefore the aim of this study is to test if breast size during fully established lactation is related to breast milk energy density and macronutrient composition.

Materials and Methods
The breast milk composition of 137 samples taken from mothers of healthy, born-on-term infants at the lactogenesis III stage of lactation was analyzed using mid-infrared transmission spectroscopy. The breast size index was calculated by dividing the breast circumference by under-breast measurements. Data on the maternal diet was collected and body composition was measured using bioelectrical impedance analysis. Mothers completed a general questionnaire in which they provided information about the birth parameters of the infant. The bioethics committee approved the study.

Results
Stepwise backward entry regression analysis showed a negative association between breast size index and lactose concentration in breast milk (β=-.245, $p<.003$). The final model, which includes breast size index, infant Ponderal Index, feeding frequency, maternal dietary fat, and carbohydrate intake together explained around 14% of the variance in the content of lactose in breast milk (R2adj=.141, $p<.001$). Milk lactose was also negatively related to maternal dietary fat intake (β=-.218, $p<.009$) and positively to the number of feedings per day (β=.175, $p<.035$). No statistically significant relationship was found between breast size index and energy density, protein, and fat content in breast milk.

Discussion
This is the first study that shows a negative relationship between breast size during fully established lactation and lactose concentration in milk in a large sample size. The observed relationship between breast size and lactose content in breast milk may be hormonal. High estrogen levels, positively correlated with breast size, may inhibit lactose synthesis by decreasing the content of mammary-specific modifier protein alfa-lactalbumin (LALBA). Since lactose is crucial for the proper development of the central nervous system, it is an important energy source and has a prebiotic effect on the intestinal microflora, its appropriate content is essential for infant development.
Due to its osmotic properties, it also affects the volume of breast milk. No relationship found between other macronutrients and breast size indicates that large breast size is not necessary for adequate milk production, however, may contribute to an altered concentration of lactose therefore in women with very large breasts, it is worth monitoring the initiation and course of lactation with more attention.

COD. P 12

ETHICS AND IMPLEMENTATION OF HUMAN MILK BANKS IN RESOURCE CONSTRAINED SETTINGS: A CASE IN SUB-SAHARAN AFRICA

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Background: Following the WHO's guidelines for optimal feeding of vulnerable infants, human milk banks (HMBs) have been developed to improve access to human milk for vulnerable infants and to ensure that milk is safely collected, quality checked, safely stored and equitably distributed. While there are over 600 HMBs globally, only very few are in lower income settings such as in Africa. There is currently only one Human milk bank in Kenya, which is at a pilot phase. Given the limited evidence on the ethical issues surrounding its implementation, research is needed to inform guidelines and subsequent policy development in this and similar settings.

Objective: The objective was to examine in-depth the ethical implications of how a HMB has been embedded into a neonatal unit in Kenya, assessing integration into broader breastfeeding practices and policies, including fit with other staff roles and responsibilities.
Methods: The ongoing study is an empirical ethics study utilising a case study approach. Data collection involves: non-participant observations; indepth interviews and focus group discussion (FGD). I am iterating data collection, and analysis utilising interview summaries, participant (mothers') stories and a framework approach for data analysis.

Results: I conducted over 50hours of observations and informal conversations, 32 indepth interviews with health workers, managers and mothers; and 1 FGD with a mothers' support group. These conversations were around the experiences of the stakeholders and perceptions and recommendations for scale. These not only included observed benefits and challenges but also how various ethical issues have been navigated in practice and what unintended (positive or negative) consequences have been observed. Further ideas about financing, policy development, scaling and decision making were sought.
Conclusion: I will present findings from the case study at Pumwani Maternity hospital detailing the context and identified ethical issues in human milk banking to inform further empirical work globally and in sub-Saharan Africa.

Acknowledgements:
Supervisors: Dr Mehrunisha Suleman, Dr Martha Mwangome, Prof Maureen Kelley, Prof Sassy Molyneux
Collaborators: Dr Kiersten Israel-Ballard, Jessica Cohen, Kimberly Mansen and Dr Emily Njuguna-Mbaire

COD. P 13

A COHORT STUDY ON COMPARISON OF VOLUMES OF BREAST-PUMP EXPRESSED DONOR HUMAN MILK AMONG TERM AND PRETERM GESTATIONAL MOTHERS IN SOUTH INDIA – TIME TO REDEFINE "COMING TO VOLUME" IN THE MILK BANK?

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INTRODUCTION
Human milk banking is an essential perinatal service. The donor milk volumes secreted by mothers vary depending on multiple factors. The present study evaluates the impact of gestational age on the volumes of milk. Further, it also re-evaluates the definition of "Coming to Volume" as the method of expression is an important determinant of breast-milk volumes.

METHODOLOGY
This cohort study was conducted at SDM College of Medical Sciences & Hospital, Dharwad, India over a period of 10 months from September 2022 to June 2023. The demographic characteristics of eligible donors were noted. The primary objective of the study was to compare the volume of donor milk secreted in relation to postnatal day among mothers delivered at term and preterm gestation. As the milk volume was higher with breast pump based expression of milk, the secondary objective of the study was to compare the traditional definition of "Coming to Volume" (secretion of 500ml per day by postnatal day 14) with the volumes of milk in the present study. As the human milk donation is voluntary and is usually done after satisfying the needs of one's own baby, a surrogate marker for "Coming to Volume" i.e An expression of atleast 80 ml in one sitting of breast-pump based expression was considered (Considering 8 expressions in a day – every third hourly). The statistical analysis was done using mean, proportion, comparison of means, p value <0.005 for significance and scatter plots as applicable.

RESULTS
A total of 458 mothers were enrolled in the study – 349 (Term) and 109 (preterm) mothers. The primigravida population [62% v/s 61%] and maternal age [24 v/s 26 years] were comparable. Maternal morbidities accounted to 6% (Term) group and 15% (Preterm). There was higher rate of LSCS among preterm mothers (74% v/s 63%). The average volumes of donor human milk were 142 ml among term mothers and 122 ml among preterm mothers (p value- 0.0064). The maximal donation occurred on postnatal days 4, 5 and 6 among both the groups. The maximum duration of donation was up-to postnatal days 40 (Preterm) and 90 (Term). Further, it was noted that 80% (280/349) of the term mothers and 75% (82/109) of the preterm mothers were able to secrete >80ml per sitting with the help of hospital grade breast-pump. This volume was attained by postnatal day 7 in 80% (223/280) of term mothers and 65% (53/82) of preterm mothers.

CONCLUSION
The present study shows that the breast-pump expressed volumes of milk among term mothers were significantly higher than preterm gestational mothers. Considering a surrogate definition of "Coming to Volume" – 80 ml in one sitting of breast-pump expressed donor milk, more than 75% of the mothers in the cohort were able to attain this volume by postnatal day 7. Since the pump expressed milk volumes are higher than manual expression of breast-milk, this study helps in identifying the mothers who attain "Coming to Volume" as champions of human milk donation and the further donation can run on a positive feedback mechanism.

COD. P 14

INVESTIGATION ABOUT WOMEN MOTHERS' HUMAN MILK DONORS AT CATALONIA IN 2019 AND/OR 2021

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Introduction:
The Human Milk Bank (HMB) is the centre specialized in Catalonia to collects, analyse, process and distributes the pasteurized Human Milk (HM) used to fed premature or hospitalized babies that cannot be lactated by their mothers. The HM comes from women who decide to pump their own milk with effort and share it anonymously and altruistically during an intense moment in their life cycle: the motherhood. This HM helps to reduce mortality's rate and/or health problems in babies.
Because the pasteurized donor HM is a rare commodity in Catalonia, this investigation aims to approach this situation from the following questions:
1. Do the women who live in Catalonia and became mothers in 2019 and/or 2021, know about the HM donation that leads and manages HMB?
2. Is it possible to classify by categories the reasons why recent mothers want to be or not to be HM donors?

Method:
This is a quantitative, prospective, and hypothetical deductive research about 742 women sample. These women were from Catalonia and became mothers in 2019 and/or 2021. In July 2022 these women answered voluntarily a virtual survey. The survey was published altruistically in Instagram by 36 people related to motherhood.

Results:
738 answers have been analysed. Each of the 26 questions of the survey had a specific numerical analysis, including the % of reliability of every table. The participant's profile is homogeneous according to demographic, geographic, psychographic and behaviour variables.

Conclusions:
1. The unknowing about HM donation that the HMB leads and manages is confirmed. The surveyed women profile is an Instagram user and promoter to HM. Considering this reality, which opportunities can this social network offer to the HMB? Moreover, Instagram is still an unknown platform by Public Health System and by Major Infant Formula Companies.
2. The possibility to categorize the reason that determines if a woman wants to be or not to be HM donor is confirmed.
- Reasons to be HM donor: altruism, HM benefits, lactate their own child and their own child has been fed by pasteurized donor HM.
- Reasons not to be a HM donor:
-- Lactation issues, as difficulties in breast feeding initiation, maintenance, extraction, and production;
-- Management issues, as time, information, daily life organization and come back to paid job.
Breast pump is an object used by almost all the women surveyed. Also is the object used to extract HM in the altruistic donation to the Milk Banks. But the breast pump is the object that stops the wish of these women to become HM donors. It is necessary a multidisciplinary investigation about the rejection of the breast pump among women

COD. P 15

EVOLVING USE OF PASTEURIZED DONOR HUMAN MILK IN HOSPITAL FOR MEDICAL INDICATIONS IN OTHERWISE HEALTHY TERM AND LATE PRETERM INFANTS

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Traditional postpartum care in the US includes standardized formula supplementation for infants whose blood sugars or bilirubin levels indicated a need to feed urgently. Resolving hypoglycemia and hyperbilirubinemia in this way was effective physiologically. Undermining moms' breastfeeding goals and journey was an inadvertent outcome. US hospitals also have a tradition of limiting pasteurized donor human milk (PDHM) to the neonatal intensive care units. Afterall, that's where we find the infants who are most vulnerable to negative effects if fed non-human milk. Decades of limited supplies of PDHM required gatekeeping that limited the supply to the most fragile baby.Growth of Baby Friendly Hospitals and other movements to improve breastfeeding rates have led to an expanded role for PDHM. Healthy infants now receive PDHM supplementally in about 30% of US hospital maternity units and even after discharge at home. Limited milk volumes needed to fill the gap before mom's milk is available mean that the costs are low for institutions. Healthy babies still needing supplemental milk upon discharge often must cover the fees up front, but processing fees can be prohibitive for families.
Discharging physicians may recommend milk for a healthy infant most especially when the infant is healthy, but small for gestational age, or when discharge weight has dropped significantly. Families bear the cost of PDHM prescribed at discharge for their healthy infants, and sometimes are prohibited from complying because they lack the funds. An inadvertent inquity in availability of PDHM is the result. Creative solutions to distribute “free” milk to the economically disadvantaged show promise in distributing milk equitably.

COD. P 16

KNOWLEDGE AND ATTITUDE TOWARDS MOTHERS' MILK BANKING (MMB) IN REPRODUCTIVE-AGED WOMEN LIVING IN GEORGIA

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Introduction: Breast milk is suggested as the ideal and sole early nutrition source for infants from birth to at least the first six months of age by the American Academy of Pediatrics.[1,2] Given the demonstrated short- and long-term medical and neurodevelopmental benefits of breastfeeding, infant nutrition should be viewed as a public health concern rather than a personal preference.[1] Milk donation is critical to meet the milk needs of special neonates, such as the ones in neonatal intensive care units or premature ones.[3] Georgia has ongoing efforts to establish the first official mothers' milk banking facility. This study aims to access knowledge and attitude toward Mothers' Milk Banking (MMB) among reproductive-age females in Georgia. Methodology: Between April and June 2023, a cross-sectional study was conducted using a simple random sampling method to select a sample of 289 women of reproductive age (18-45). Data collection involved distributing a pre-prepared questionnaire through social media platforms. Results: Although there is a significant knowledge gap among reproductive women in Georgia regarding the benefits of breast milk compared to formula (only 57% recognize its nutritional superiority and 51% acknowledge its infection risk reduction for newborns), the primary concern lies in the lack of trust in future local milk banking facilities. Merely 31% of women expressed confidence in the safety and reliability of future milk banks in Georgia. In case they could not produce milk, only 30% of women preferred donated mothers' milk, while 53% favored formula and 16% preferred milk from relatives or friends. The overwhelming majority of women, approximately 89%, are willing to donate their surplus milk if they happen to produce an excess amount. A noteworthy 67% reported never having heard of milk banking before, but a substantial majority (87%) expressed a desire to learn more about it in the future. The donated milk is deemed most essential for NICU patients by 77% of women, for premature infants by 20%, and for term infants by 3%, reflecting varying perceptions among women regarding the primary beneficiaries of this valuable resource. Interestingly, women with a personal history of a neonatal intensive care unit (NICU) experience among their relatives or acquaintances were more inclined to prefer donated milk over formula (p-value = 0.025). Additionally, women with higher education demonstrated greater confidence in the safety and reliability of future milk banks in Georgia than those with only secondary or vocational education (p-value < 0.05). Conclusion: This study highlights a significant knowledge gap and lack of trust in future milk banking facilities among reproductive women in Georgia. Education and awareness initiatives are needed to promote understanding and confidence in mothers' milk banking, ensuring optimal infant nutrition.

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COD. P 17

EXPERIENCE WITH MICROBIOLOGICAL SCREENING OF HUMAN DONOR MILK AND 9 YEARS OF DATA AT A TERTIARY UNIVERSITY HOSPITAL IN AUSTRIA

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Background: Distinct heterogeneity exists regarding the strategies for microbiological screening in the context of human milk banking across European countries with regard to time of sample collection, frequency of sample collection and the accepted bacteria and bacterial load for feeding of human donor milk (HDM) in preterm infants.

Aim: Over 9 years, we collected our experience on microbiological screening of HDM, based on a retrospective analysis of microbiological findings in unpasteurized HDM.
Methods: A retrospective data analysis of routinely acquired data from November 2009 to November 2018 was performed. The data collected are analysed using descriptive statistical methods. Bacterial count is determined from frozen (≤ -20°C) raw donor milk samples. Columbia agar was used for cultivation. Identification of bacteria was done via matrix assisted laser desorption ionization-time of flight mass spectrometry (MALDI-TOF MS) and reported in CFU/ml (colony forming unit).

Results: In total, 5,741 samples from 232 donors were analysed for bacterial load and 64 different bacterial species were found.
Top ten species found in analysed samples were Staphylococcus epidermis (n=4,675), Enterococcus faecalis / Streptococcus faecalis (n=611), Staphylococcus aureus (n=571), Coagulase-negative staphylococcus (n=323), Escherichia coli (n=132), Enterococcus sp. (n=83), Klebsiella pneumonia (n=81), Staphylococcus lugdunensis (n=62), Staphylococcus hominis (n=61), Staphylococcus haemolyticus (n=58). 770 (13.4%) samples showed ≤ 10^2 CFU/ml, 1,738 (30.3%) samples showed 10^3 CFU/ml, 1395 (24.3%) samples showed 5x10^3 CFU/ml, 895 (15.6%) samples showed 10^4 CFU/ml and 914 (15.9%) samples showed > 10^5 CFU/ml. For 29 (0.5%) samples CFU/ml were not reported. Clearance for the usage of HDM for preterm infants was given if CFU were ≤ 10^4/ml. Donor milk was excluded if total CFU/ml were > 10^4, Staphylococcus aureus was ≥ 10^4 or if Staphylococcus haemolyticus, Enterococcus, Escherichia coli or Serratia marescens were cultivated. 3,871 (67%) samples were cleared for the use as HDM, while 1,870 samples were excluded from donation (33%).

Discussion: Different bacterial species naturally occur in human milk and may exert various beneficial effects for the receiving infant. Strategies for microbiological screening in the context of human milk banking depend on the feeding type of HDM (raw vs. pasteurized feeding), gestational age and individual risk assessment of the recipients, all with the goal of risk reduction.

COD. P 18

ANALYSIS OF DORNIC ACIDITY IN MATURE AND RAW HUMAN MILK EXPOSED TO VARYING TEMPERATURES, HOSPITAL UNIVERSITARIO "DR. JOSÉ ELEUTERIO GONZÁLEZ" UNIVERSIDAD AUTÓNOMA DE NUEVO LEÓN

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Introduction: Titratable acidity (Dornic) is a cost-effective, rapid, and reliable method that measures the number of tenths of milliliters of NaOH required to neutralize 1 ml of milk using phenolphthalein. Dornic acidity in degrees directly indicates the presence of mesophilic aerobic bacteria in Human Milk (HM) samples, with acceptable values ranging from 1 to 8 Dornic degrees (averaging between 3 and 4 degrees).Thawed Raw Human Milk (RHM) can remain at room temperature for up to 4 hours without compromising its biochemical and nutritional composition, with a maximum temperature of 32°C. However, in Monterrey, Mexico, summer temperatures can reach 40°C or higher. The primary objective is to identify the time and ambient temperature at which RHM and thawed RHM experience an increase in Dornic acidity.Materials and Methods: This prospective clinical trial, approved by the Ethics Committee under code PE22-00020, utilized RHM donated to the Human Milk Bank (HMB) at Hospital Universitario "Dr. José Eleuterio González" between February and July 2023.
Inclusion criteria encompassed mature RHM with normal physicochemical characteristics, compliant with the Global Network of HMB guidelines. Exclusion criteria involved RHM frozen for more than 14 days, and elimination criterion was incomplete milk heating for a minimum of 4 hours.The thawing process involved a water bath method (constant immersion heating) until the temperature reached 2-4°C. Baseline Dornic acidity was measured, and the samples were divided into four groups with 10 ml aliquots each (Group 1: 25ºC, Group 2: 30ºC, Group 3: 35ºC, and Group 4: 40ºC). Titratable acidity in Dornic degrees for each sample in each group was measured after 2 and 4 hours of exposure. The samples were cultured on violet red bile agar and blood agar, with readings taken at 24 and 48 hours.Results: A total of 15 samples of mature RHM were analyzed. The baseline titratable acidity ranged from 2 to 4 Dornic degrees for all samples. After 2 hours of exposure, the range extended from 2 to 5 Dornic degrees, and after 4 hours of exposure to heat, at temperatures of 30°C, the range increased from 2 to 6; at 35°C, from 2 to 7; and at 40°C, from 2 to 8 Dornic degrees, respectively. Cultures showed 20% negative results, 50% saprophytic flora (S. epidermidis), and 30% tested positive for enterobacteria.
Conclusions: While Dornic acidity levels did not exceed 8 degrees after 4 hours of exposure to varying temperatures, there was a trend of increased titratable acidity after 4 hours, particularly at temperatures of 30°C or higher. The clinical trial will continue to achieve a statistically significant sample size and offer more robust conclusions.

COD. P 19

IMPLEMENTING A PATIENT-CENTERED CARE MODEL IN NEONATAL UNITS: INTRODUCING A NEW CIRCUIT FOR STORING AND SHIPPING HUMAN MILK FROM DONOR MOTHERS WITH HOSPITALIZED CHILDREN

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Background:
When a child is hospitalized with a serious or life-threatening disease, the entire family everyday-life is disrupted. Currently, familycentered care models that provide hospital accommodation for the whole family have emerged as a potential solution to promote parentinfant closeness and improve neonatal outcomes. As some mothers in these situations can also become milk donors, a new need has arised, being necessary the implementation of a new circuit for storing and shipping human milk from Neonatal Units (NU) to Human Milk Bank facilities.

Objective:
The aim of the present study was to describe the feasibility of implementing this new circuit and to learn about the experience and satisfaction of donor mothers.

Material and Methods:
A multidisciplinary team designed and developed instructions in order to organize milk storage and shipping from NU for families participating in "Make yourself at home" program. The lactation reference nurse identified potential donors and arranged selection visits at the hospital blood ant tissues bank. Once a donor was accepted, the milk was stored at -4ºC in NU facilities from Monday to Thursday and shipped daily to local Bank, who also send it to the reference Human Milk Bank. From Friday to Sunday the milk was frozen in the neonatal unit and shipped on Monday. As quality indicators, we evaluated the number and characteristics of milk donors in this program and we also conducted telephone interviews to assess satisfaction rates. The study included all donors from August 2022 to May 2023.

Results:
During analysis period, we enrolled 10 milk donors in the program. They donated an average of 16 liters (range: 0.2-59). The median age of mothers was 32 years (range 25-40) with 40 % being native of another country. Regarding childbirth, 60% of cases were by caesarean section and the median number of days until the first donation was 32 (range 7-75). The primary reason for neonatal admission was complications related to prematurity (70%) being 40% of them extremely preterm (less than 28 weeks). The mean hospital stay was 78 days (range 28-192). All milk shipments from NU were done without major incidents. When we asked about the reason for becoming donors, 8 out of the ten mothers reported having leftover milk and 90% expressed their desire to help other hospitalized children. All of them found that the new circuit facilitated their chance to donate during baby´s hospitalization. As areas for improvement, donors highlighted the need to implement the same model in other pediatric hospitalization units and to increase comprehensive understanding of the circuit´s details by all healthcare professionals.

Conclusion:
- Implementing a new circuit for storing and shipping human milk from donor mothers with hospitalized children in NU is feasible and is highly value by mothers.
- In the future, the extension of this model to other pediatric hospitalization areas should be considered to promote the well-being of donor families.

COD. P 20

DOES MATERNAL GESTATIONAL DIABETES AND OTHER COMORBIDITIES AFFECT THE MACRONUTRIENTS COMPOSITION OF COLOSTRUM?

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Introduction: It is already known that breast milk composition is dependent on e.g. duration of lactation, genetic and environmental factors, and to some extent maternal dietary habits and lifestyle. The influence of maternal health conditions on the mean content of particular nutrients in breast milk is still unknown. Based on available literature, variations in study results were found.
The aim: The aim of the study was to evaluate macronutrients composition of colostrum received from mothers diagnosed with gestational diabetes, both treated with diet or with insulin, in comparison to colostrum of healthy non-diabetic mothers. The macronutrients content of colostrum was also evaluated in terms of other maternal factors: concomitant comorbidities and demographic data.

Materials & Methods: A total of 70 participants were enrolled in case-control study:within mothers diagnosed with gestational diabetes n = 21 were treated with diet and 29 were treated with insulin; there were also 20 non-diabetic mothers as control. The breast milk samples were collected from mothers up to the 7th day after delivery, with mean 3.4 (SD ± 1.0) days. All samples were collected using a breast pump, in the morning, after the first newborn's feeding. The milk samples were cooled immediately after collection, portioned and frozen (-80 C) until analysis. The macronutrient content was measured with Human Milk Analyser (HMA), Miris, Uppsala. As the database included missing data, a method of multivariate imputation by chained equations (MICE) was implemented. Further statistical analyses were performed using Shapiro-Wilk test, Kruskal-Wallis ANOVA, ANOVA, Chi-square test, regression analysis and cluster analysis, with statistical significance level set at $p<0.05$.

Results: Samples of colostrum collected from all participants were analysed for total fat, total protein, carbohydrates, true protein, dry matter and energy. Significant differences in the concentration of dry matter ($H (2, N=70) = 5.65$, $p<0.05$) and energy ($H (2, N=70) = 6.09$, $p<0.05$) were found between the study groups. Among all mothers total protein ($H (2, N=70) = 5.57$, $p<0.05$) and true protein ($H (2, N=70) = 7.45$, $p<0.05$) concentrations differed in terms of maternal history of hypothyroidism, whereas concentrations of other macronutrients where found similar ($p<0.05$). However, no differences in colostrum's macronutrients composition in terms of gestational weight gain, parity, history of hypertension, nor history of nicotinism were found ($p<0.05$). There were neither significant differences between diabetic mothers treated with diet nor those treated with insulin ($p<0.05$).

Conclusions: Nutritional composition of colostrum is dependent on maternal health conditions, particularly concerning concentrations of total protein, true protein, dry matter and energy. The differences might vary due to the cumulative effect of concomitant ailments, especially if these ailments had begun prior to the pregnancy.

COD. P 21

CHARACTERIZATION OF HUMAN MILK DONORS: EXPLORING THE RELATIONSHIP WITH THE DONATION PROCESS

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INTRODUCTION: Human milk banks are essential facilities to supply donated human milk (DHM) to preterm and term infants with health complications. Obtaining DHM voluntarily by nursing women is the first step to be developed and therefore an essential point in the donation process. Information about milk bank donors and understanding the challenges they face can offer valuable insights for donor recruitment and help facilitate the donation practice.

AIMS: To assess the donor and their newborn characteristics and to identify associations with the starting time and length of the donation during the first and second year of the milk bank operation in the Reina Sofia University Hospital of Cordoba (Spain). In addition, we aimed to detect any distinct patterns within these associations due to the pandemic situation.

METHODS: This is a cross-sectional study carried out in two periods. Data were collected during the first two years of its operation (Annual Period 1 (P1): April 2019 – March 2020; Annual Period 2 (P2): April 2020 – March 2021). Donor age, educational level, employment status,
maternity leave, gestational age (GA), parity, birth weight of the child and prematurity were collected. The time that elapsed between the delivery and the start of the donation was calculated. General linear models (GLM) were performed to examine the association of donor and newborn characteristics with starting time and length of donation.

RESULTS: A total of 51 and 25 women donated part of their HM in P1 and P2, respectively. Donor age, employment status, GA, parity and newborn characteristics were not different between periods ($p>0.05$). Differences were detected in the educational level, with a homogeneous distribution in P1 (No studies/basic studies: 54%; High education: 46%), while in P2 a higher proportion of donors had higher education (P1: 46% vs. P2: 70.8%, $p=0.045$). The employment status was similar between P1 and P2, highlighting that in both, 40% of donors were on some type of maternity leave. A considerable proportion of donors were actively working when they started the donation (P1: 32.4%; P2: 25%), and a large part of them, especially in P2, at full-time (P1: 66.7%; P2: 100%). The employment status showed an association with the time that women took to initiate the donation in both periods. In P1, women on maternity leave took less time to start donating compared to women who were actively working (14 vs. 43 weeks, $p=0.002$). During P2, unemployed women and women on maternity leave took fewer days (15 and eight weeks, respectively) to initiate donation after giving birth than women who were working at that time (47 weeks, $p=0.006$ and $p<0.001$). Any clinical or social characteristic was associated with the length of donation ($p>0.05$).

CONCLUSION: Employment status has been shown as a decisive factor in initiating HM donation, even during the COVID-19 pandemic.
Further efforts are needed to identify common donor characteristics that influence the starting of donation. Nevertheless, these findings highlight the necessity of supportive policies and workplace accommodations that allow mothers to balance HM donation with their work responsibilities.

COD. P 22

RECOMMENDATIONS FOR ADDRESSING FOOD SAFETY CONCERNS IN HUMAN MILK BANKS

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Mother's own milk (MOM) is the first choice for the nutritional and biological requirements of all neonates, including tiny preterm and critically ill infants. When MOM is not available or insufficient, donor human milk from a well recognized Human Milk Bank (HMB) is the best alternative. Although some bioactive milk components are lost to varying degrees with the heat treatment methods widely used in HMBs, many other precious bioactive compounds are completely or partially preserved, which are not found in preterm formula. The greatest advantage of DHM in very preterm infants, is protection against necrotizing enterocolitis when compared to formula. To ensure safe operation of a HMB, a well designed safety assurance plan should be put in place. Infectious and toxicological risks are the main potential risks that operators of HMBs must undertake to eliminate, and they are of the same type as those related to both transfusions of blood products and food consumption. HMBs implement procedures that allow to manage and sanitize the milk without altering significantly the nutritional and biologically protective components of human milk, obtaining a product characterized by a valid balance between safety and biological quality. The infectious risk is the most relevant for recipients born preterm, however bank human milk has very low probabilities of causing an infection and even lower of causing significant harm. The selection of donors is the first link in a chain of procedures implemented by banks, based on the principles of Hazard Analysis and Critical Control Points (HACCP), to obtain quality milk and reduce the infectious and toxicological risk for recipients. It aims to identify specific conditions that contraindicate donation (permanently or temporarily). It must be performed by medical personnel, and allows enrollment of only low-risk donors. It is based on the existing rules for blood donation, adapted to the different degree of risk of human milk. The milk taken over by the HMBs must be stored, maintaining the cold chain, with continuous temperature monitoring and subjected to checks that measure the quantity of bacteria present in it.If it is contaminated beyond a certain limit, it must be discarded. Pasteurization is an effective means for sanitizing milk: all the milk that arrives at the HMB must be pasteurized. Holder pasteurization is recommended, and it is performed using low temperature and long time (+62.5 °C for 30 minutes). Pasteurization is essential for the safety and quality of donated milk, but it represents only a part of the chain of the entire process managed by HMBs, and the tightness of the system is guaranteed only if there are no weak links. Hence the importance of managing the milk by observing correct procedures throughout the supply chain. HMBs operators must compulsorily implement self-monitoring, at whatever level they are involved in the food chain, to guarantee control of the hygiene and safety of the final product and must document the methods of implementation of the procedures carried out, keeping the documentation for a correct and secure human milk management. Only by following all these precautions, HMBs will be able to produce and offer a safe food of high nutritional quality.

COD. P 23

ORAL DOMPERIDONE VERSUS PLACEBO FOR ENHANCING EXCLUSIVE BREASTFEEDING AMONG POST LOWER SEGMENT CAESAREAN SECTION MOTHERS – A DOUBLE BLIND RANDOMIZED CONTROLLED TRIAL

A. Bethou[1]

Objective
To assess whether oral domperidone compared to placebo increases the rate of exclusive breastfeeding for 6 months among post lower segment caesarean section (LSCS) mothers.

Methods
This double blind Randomised Controlled Trial, conducted in a tertiary care teaching hospital in South India, included 366 post LSCS mothers with delayed initiation of breastfeeding or with subjective feeling of not enough milk. They were randomised to two groups
- Group A: Standard lactation counselling and oral Domperidone and Group B: Standard lactation counselling and a placebo. The primary outcome was exclusive breastfeeding rate at 6 months. Exclusive breastfeeding rate at 7 days and 3 months and serial weight gain of infant were assessed in both groups.

Results
Exclusive breastfeeding rate at 7 days was statistically significant in the intervention arm. The exclusive breastfeeding rates at 3 months and 6 months were higher in the domperidone arm compared to placebo but not statistically significant.

Conclusion
Oral Domperidone along with effective breastfeeding counselling showed increasing trend of exclusive breastfeeding rate at six months. Appropriate breastfeeding counselling and postnatal lactation support are important in enhancing exclusive breastfeeding.

COD. P 24

THE IMPORTANCE OF GOOD DONOR SELECTION IN A MILK BANK

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INTRODUCTION

One of the advances in the history of neonatology has been the use of donated human milk in the units, managed through milk banks. An adequate selection of donors is essential for the proper functioning of these banks: the ideal would be to obtain the maximum possible volume of quality milk with the least possible use of resources.

OBJECTIVES

The primary objective of the study is to determine whether there are any demographic or clinical characteristics of donor mothers that are associated with a greater volume of breast milk delivered to the bank. The secondary objective is to describe the demographic and clinical characteristics of the donors and their offspring.

MATERIAL AND METHODS

The present study is a retrospective descriptive study collecting information from completed donors who were accepted between November 2017 and March 2023. We analyzed variables of the donor mothers (age, studies, professional activity, nationality, place of residence, stable partner, previous children, how she knew about the bank), of the breastfed children at that time (age at the start of donation, history of admission to neonatology or prematurity) and of the donation process itself (duration, year of initiation, volume of milk donated, use of the home collection service).

RESULTS-DISCUSSION

Data from a total of 204 donors, who delivered a mean milk volume of 4.9±9.6 liters (ranging from 0 to 100 liters), were analyzed. The mean age of these donors was 34.6±4.5 years. The 86.3% were women of Spanish nationality. A total of 89.7% were working mothers, 49.5% of whom had a university education. Thirty percent of the mothers were health professionals, although this condition was not significantly associated with higher milk volume delivery. One third of the mothers were aware of the milk bank at the health center. The majority (95.6%) had a stable partner. Slightly more than half of the mothers had only one child (58.8%), most of them being full-term infants (93.1%). Some 11.3% of the children had required admission to the neonatal unit. Approximately half of the infants (47.5%) were less than three months old at the time the donation was initiated.

Several factors associated with donation of 4 liters or more (the minimum volume that is acceptable for our milk bank) were observed ($p<0.05$): age of the infant child less than 3 months and being born at term; donation time greater than 3 months; use of the home collection service; having a stable partner.

CONCLUSIONS

The profile of a mother with a breastfed infant under 3 months born at term, with a stable partner, who uses the home collection service and donates for more than 3 months is that of a donor who delivers a volume of acceptable to the bank (4 liters or more).

Knowing these characteristics can help to design campaigns to optimize the milk bank's resources.

COD. P 25

BANK MILK EXPOSURE AND B.CEREUS CONTAMINATION: SINGLE CENTRE EXPERIENCE

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Objectives:
Human milk banks must be used to enhance nutrition or to complete the mother's milk production. Since the intake of inadequately managed LUD is associated with potential serious risks the Meyer Children.Hospital Donated Human Milk Bank (Meyer BLUD) refers in its management to the AIBLUD National Guidelines by conducting sampling on pre-pasteurization donated milk extractions and randomized testing on pasteurized milk samples routinely (3/month) with detection of total mesophilic load, Enterobacteriace, Staphylococcus aureus and Bacillus Cereus.
In recent years, particular attention has been paid to Bacillus cereus, a Gram-positive, spore-forming bacteria. It can produce toxins which cause food poisoning, but it is also a recognised opportunistic human pathogen that can cause severe local and systemic infections among at-risk populations, including neonates.
The infective dose of B. cereus in human milk is not known. We report on our neonatal centre's experience with evidence of neonatal contamination by B. Cereus in association with bank milk intake.

Methods:
During the years 2021-2022, 72 samplings were performed on pasteurized milk 9 of which tested positive for Bacillus Cereus with a bacterial load >1 CFU (12.5%) .The investigation was conducted on infants in our NICU, tested randomly. A possible correlation between B Cereus contamination and contact with bank milk was sought by association analysis (significant pvalue<0.05) and in particular a correlation with B Cereus-related local or systemic infectious events was sought. Clinical data were searched retrospectively.

Results:
Of a total of 232 infants in our NICU randomly tested 26% were premature and 13% had malformative diseases of the gastrointestinal system. 9% of the patients were immunodeficient. 75% of the infants had contact with banked milk and 6% were completely fasted. In 6 infants a sepsis event occurred, none related to B Cereus infection. 4% of the infants presented diarrhoea; no rectal swabs were positive for B cereus. No clinically significant events were related to exposure to bank milk. Only one patient tested positive on a skin swab for Bacillus cereus, but the contamination was not related to exposure to bank milk.

Conclusions:
We presented our experience in the Meyer Children's Hospital NICU regarding exposure to bank milk and possible Bacillus Cereus contamination. No children were found to be contaminated with the pathogen, with a clear lack of correlation between exposure to bank milk and contamination. No significant infectious events or gastrointestinal diseases were correlated with exposure to bank milk.

COD. P 26

OPTIMIZING A CONTINUOUS QUALITY IMPROVEMENT COMMITTEE TO FACILITATE AVAILABILITY, QUALITY AND SAFETY OF PASTEURIZED DONOR HUMAN MILK

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[2]Standards Committee, Human Milk Banking Association of North America

The Human Milk Banking Association of North America publishes regulations for operating a non-profit milk bank in the US and Canada.
Recognizing ongoing threats to quality, safety and quantity of available pasteurized donor human milk (PDHM), required the formation of a unique committee. The HMBANA Standards Committee, consisting of volunteers from established milk banks, creates and continually updates the standards. The Standards are shared with HMBANA accredited milk banks and serve to educate and guide milk bank staff. Fluidity of regulations is necessary to respond appropriately to challenges, such as COVID-19 or the Abbott formula crisis. HMBANA Standards are subject to yearly updates. The committee relies on scientific literature, food science updates, and new developments in mother infant care. The committee additionally draws on expert advisors outside of milk banking to inform management of current public health issues, and to recommend updates in management of donor lifestyle and health statuses. An example of the work product of the committee is the Medication Tool. Created with guidance from experts in the pharmacological and human milk arena, this tool is dynamic and updated as new evidence or medications emerge. The practical and easy to use tool removes guess work for milk bank donor screeners and improves donor screening consistency across North America.

COD. P 27

LI-LAC

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Li-LAC MB (Milk Bank)
Li-LAC MB is a web based application that provides a centralised barcode labelling and tracking control system for breast milk bank management. It can be hosted on a cloud service provider or on a hospitals' internal network. The system manages all aspects of breast milk donation, testing, processing and distribution. This includes the management of all donors, their tests, donor communications and donor documents.
Li-LAC MB (Milk Bank) - Features
• Specifically designed for managing human milk bank donations
• Adheres to NICE Guidelines and compliant to ISBT 128 barcodes
• Full traceability, from donor to issued product
• Enforces standardised labelling of products, integrated into production process
• Work flow management allows multiple processing workflows to be defined and managed for different milk products
• Consistent and rigorous testing regime with testing profiles for donors and products defined at site level
• Control of milk products to ensure only authorised products are released
• Removes the risk of contaminated products being released
• Immediate visibility of milk stocks and their process state
• Facility to manage milk in batches
• System can be locally installed or used via the Cloud.
Li-LAC MB (Milk Bank) - Benefits
• All breast milk can be traced back to the milk's donor
• All breast milk bottles are uniquely identified with an industry standard barcode
• A Product Hold is automatically placed on milk to stop it being issued should any problems be found with the milk or donor
• Removes the risk of contaminated products being issued
• Standardised process ensures traceability and consistent labelling at all stages
• Donors are centrally managed, with all donor communications held in the database
• Donor Health Checks and Consent are held on-line
• Immediate visibility of milk stocks both in the milk bank and stock holding locations
• Milk Issue reports for hospitals can be configured and used for invoicing
• Potential to increase the available of donor milk and maximise the potential health benefits of donor milk. The Li-LAC MMC app is a simple, easy-to-use system that ensures a mother's milk is only fed to her baby every time, in a neonatal or maternity unit.
Li-LAC MMC: Benefits
• Ensures that maternal milk expressed in maternity unit is given to the correct baby.
• Removes the possibility that a baby may be fed the wrong mother's milk.
• Captures of the feed volume, feed type and feed time for all baby feeds.
• Labels and records all baby feeds, including EBM, DEBM, formula and fortified milk.
• Builds an audit trail of all feeds and the product fed to the baby.
• Records attempted mis-feed information to allow additional training needs to be identified.
• Records which maternity unit staff member carried out the feed.
Li-LAC MMC: Features
• Uses Zebra TC52-HC touch computer with an interface similar a mobile phone.
• Zebra TC52-HC is compliant with infection control processes.
• All labels are produced using ISBT standard barcodes.
• Works with existing mother and baby wristband barcodes.
• Feed log information can be exported from app to be loaded into a maternity system.

COD. P 28

COMPARATIVE ANALYSIS OF BREAST MILK MACRONUTRIENTS IN RELATION TO MATERNAL DIET AND GRAVIDITY AND NEONATAL GENDER AND GESTATION AGE: A PROSPECTIVE OBSERVATIONAL STUDY

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[3]Department of Global Health, Oslo University Hospital, Oslo, Norway

Background: Breast milk is a vital source of nutrition for infants, providing essential macronutrients necessary for growth and development.
Composition of breast milk depends on a variety of factors. Till date, limited research has investigated the composite influence of maternal and neonatal factors on breast milk macronutrients. This prospective observational study aims to examine and compare macronutrient composition of breastmilk from mothers delivering at different gestation periods viz. extremely preterm (less than 28 weeks), very preterm (28 to 31+6/7 weeks), moderate to late preterm (32 to 36+6/7 weeks) and term (37 weeks and more), their gravidity and diet (vegetarian/non-vegetarian), and the gender of the baby.

Methods: A total of 777 lactating mothers with infants of varying gestational ages [extreme preterm (n=78), moderate preterm (n=105), late preterm (n=190) and term (n=404)] were recruited for this study and their breast milk samples were collected. Macronutrient concentration of lipids, proteins, energy and carbohydrates were analyzed using infrared transmission spectroscopy (MIRIS AB, Uppsala, Sweden). Maternal dietary information was collected using validated dietary assessment tools. Statistical analyses, including analysis of variance (ANOVA), t-test and multiple linear regression were conducted to compare the macronutrient composition and assess the impact of maternal gravidity, diet, and baby's gestation and gender on breast milk macronutrient profiles.

Results: True protein concentrations decreased from extreme preterm to term milk (p= 0.026) while fat content increased from extreme preterm to term milk (p= 0.029). Carbohydrate concentration and caloric count remained stable across these gestations. Maternal diet influenced protein concentrations, with higher levels observed in mothers consuming a non-vegetarian diet (1.524 ± 0.479 g/dL, p=3.817E-10) compared to those with a vegetarian diet (1.497 ± 0.368 g/dL, p = 0.025). Gender-based differences were observed in carbohydrate concentrations of breastmilk, with women delivering male infants having higher carbohydrate levels (7.25 ± 0.96 g/dL, p=0.001) compared to those delivering female infants (7.17 ± 1.51 g/dL, p = 0.041). There were no significant differences in macronutrient composition in relation to other factors.

Conclusion: This prospective observational study demonstrates that breast milk macronutrient composition is influenced by gestational age, maternal diet, and the gender of the baby. Preterm breast milk has higher protein concentration and lower fat concentration.
Maternal diet influences protein concentration and infant's gender affects carbohydrate levels. These findings highlight the importance of considering multiple factors when designing individualized nutritional strategies for infants. Further research is needed to elucidate the underlying mechanisms and long-term implications of these findings.

COD. P 28

COMPARATIVE ANALYSIS OF BREAST MILK MACRONUTRIENTS IN RELATION TO MATERNAL DIET AND GRAVIDITY AND NEONATAL GENDER AND GESTATION AGE: A PROSPECTIVE OBSERVATIONAL STUDY

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[1]Department of Neonatology, Lady Hardinge Medical College & Associated Hospitals, New Delhi, India
[2]National Comprehensive Lactation Management Centre, Lady Hardinge Medical College & Associated Hospitals, New Delhi, India
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Maternal diet influences protein concentration and infant's gender affects carbohydrate levels. These findings highlight the importance of uconsidering multiple factors when designing individualized nutritional strategies for infants. Further research is needed to elucidate the underlying mechanisms and long-term implications of these findings.

COD. P 29

EVOLUTION OF FOLLOW-UP WITH BEREAVED DONORS OF HUMAN MILK IN THE MILK BANK OF THE REGION OF MURCIA

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Introduction
Since the creation of the Milk Bank of the Region of Murcia in 2020, the nurse/midwife in charge of the Donor Care Consultation (D.C.C.) in the area has the responsibility of identifying, providing initial support, advising regarding the lactation process, and monitoring those mothers who have decided to donate, specifically focusing on mothers experiencing perinatal grief. Additionally, the nurse/midwife will conduct outreach and training activities to increase awareness and visibility of perinatal grief among healthcare professionals and society at large.

Objective
This descriptive retrospective study aims to analyze the work carried out by the milk bank concerning the care of bereaved donors of breast milk from its inception in 2020 until the present.

Materials and Methods
Data were collected from the specific software for the Milk Bank (GALA computer program).

Results
Nine bereaved donors were registered:
• For the possible grief situations supported by the Spanish Association of Human Milk Banks, the number of donors, donated volume, and number of recipients were as follows:
1. Donation of previously expressed milk before the death - 6 donors: 2,175 ml, 0 recipients; 3,705 ml, 15 recipients; 38 ml, 0 recipients; 390 ml, 4 recipients; 19,995 ml, 6 recipients; 22,580 ml, 29 recipients.
2. Donation of milk extracted when there is another breastfeeding infant alive: another child, multiple births - 2 donors: 4,860 ml, 10 recipients; 135 ml, 1 recipient.
3. Donation of milk extracted during the process of natural inhibition after death - 1 donor: 5,425 ml, 1 recipient.
4. Donation of milk extracted after the death of a baby, without intending to inhibit lactation - 0 donors.
• Other relevant data:
3 cases were multiple births, in 1 case both newborns died.
2 deaths were prenatal (one fetus in multiple births and another single fetus).
7 deaths were postnatal (all newborns were hospitalized, and only one was a recipient of donated milk).
3 mothers initiated donation before the death, of which 2 (a single born baby) did not continue donating, and 1 did (multiple births, two babies, one survived).

Conclusions
The nurse/midwife responsible for the D.C.C. provides personalized care to bereaved mothers regarding the management of their lactation, informing them of all possibilities: pharmacological inhibition, natural inhibition, maintenance of lactation, and donation of expressed milk. Some studies advocate that donation in grief can be helpful for women in coping with their grief, although further investigation is still needed. In our Milk Bank, all mentioned donors showed receptivity to follow-up, but there is no record of bereaved mothers who were contacted for lactation counseling and decided not to donate. Also, there were no bereaved donors without the inention of inhibit their lactation. These two areas has been identified as point of improvement.

COD. P 30

PERSPECTIVES OF HUMAN MILK BANKING IN SOUTH INDIA, WITH REVIEW OF LITERATURE. THE JOURNEY OF BARRIERS BROKEN AND WISDOM GAINED BY MILK KINSHIP

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INTRODUCTION
Human milk banking is one of the life-saving interventions that have benefitted mother-infant dyads on a large scale. PDHM (Pasteurised Donor Human Milk) was one of the most commonly written prescriptions in our hospital over the last 12 months. The establishment of a milk bank at our institute and it's functioning over the last 12 months has taught us social, medical and ethical lessons that are unique.

METHODOLOGY
This article is a descriptive study with appropriate review of literature that discusses the scenarios in a high perinatal volume setting, SDM College of Medical Sciences &Hospital, that is situated in south India. The data was collected over a period of 12 months from June 2022 to June 2023. The primary objective of the study is to present the milk movement in the human milk bank at our institute and its impact on the usage of commercial infant formula usage. The guidelines framed by Indian Academy of Pediatrics (IAP), Academy of Breastfeeding Medicine (ABM), CDC have been the foundation on which the milk bank guidelines are built. The article also highlights the unique situations that made the milk bank team brainstorm, review literature, discuss, concur and take clinical decisions on a few gray areas unique to milk bank.

RESULTS
A total of 70 litres of Donor Human Milk has been pasteurised over the last 12 months, donated by 474 mothers and catered to 339 eligible recipient infants. The term and preterm gestational mothers donated an average of 145 and 113 ml/ mother /day respectively. 1/5th of the donor population belonged to preterm gestation. The usage of commercial infant formula per month reduced to <5% of average monthly prescription in NICU and postnatal wards. The high prevalence of superstitious beliefs leading to lesser donation of human milk and its solutions, an example of meticulous home collection of milk, a father desperate to provide PDHM by transporting milk to another district, the gray areas of wet nursing, raw human milk banking, re-pasteurisation of infected PDHM sample and hyper-lactation and its management have been presented with review of literature. Our experience on the need of PDHM for babies born through surrogacy and adoption have also been discussed.

CONCLUSION
The present study deals with a movement of 70 litres of donor human milk in a high perinatal volume setting with just adequate number of donor mothers. The usage of commercial infant formulas was reduced to less than 5% of the average monthly usage since the inception of human milk bank. The prime areas like balancing of demand supply chain in milk bank, human resources and data maintenance were the key areas of smooth functioning of milk bank. The way forward for our human milk bank is to increase the quantity of donor milk through quality improvement initiatives, to address knowledge gaps with appropriately designed studies and also to contribute to production of human milk based human milk fortifier.

COD. P 31

A HEALTH NEEDS ASSESSMENT FOR THE ESTABLISHMENT OF A DONOR HUMAN MILK BANK IN THE REPUBLIC OF IRELAND

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A Human Milk Bank (HMB) is a service established to recruit milk donors, collect donor human milk (DHM), and process, screen, store and distribute the milk to meet the needs of infants. Currently, the only HMB operating on the island of Ireland is located in Enniskillen, County Fermanagh. This Health Needs Assessment was conducted to determine if there is an unmet health need with respect to provision of DHM to infants in the Republic.A literature review was undertaken to determine the evidence-base for supplying infants with DHM and data analysed to describe the infant population need for DHM in the Republic of Ireland. A national survey of DHM usage in 19 maternity units and 2 paediatric centres was performed to describe current service provision and the response rate was 90.5%. In addition, stakeholders (service users and service providers) were consulted to ascertain their views on DHM supply, barriers to DHM provision and their vision for an ideal milk banking service.This assessment determined that there is an unmet health need for greater provision of DHM to infants in the Republic of Ireland. DHM is currently supplied to infants in ROI by Western Trust Milk Bank in Enniskillen, and Milk Banks in the UK. The Western Trust Milk Bank provided approximately 620 litres of DHM to ROI on average during the period 2015-2017. In 2018, the Western Trust Milk Bank supplied 85 litres DHM to ROI (Western Trust Milk Bank closed temporarily in 2018), Hearts Milk Bank supplied 75 litres (only March-November 2018 data available for Hearts Milk Bank), and the Milk Bank at Chester supplied 390 litres. Therefore, available data indicates that ROI received 550 litres DHM in 2018. Service provider and service user stakeholders identified the necessity for government funding to support DHM provision, readily available DHM, development of national standardised DHM prescribing criteria, and rectification of the education deficits of healthcare professionals and the public with respect to DHM benefits.There is scope to explore the possibility of establishing a milk bank in the Republic in a future cost-effectiveness analysis.

Recommendations resulting from the findings of this assessment have been presented to the National Breastfeeding Implementation Group and will inform future service planning.

COD. P 32

START-UP EXPERIENCE OF A HUMAN MILK BANK IN NORTHERN MEXICO: HOSPITAL UNIVERSITARIO "DR. JOSÉ ELEUTERIO GONZÁLEZ

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Introduction: The Human Milk Bank (HMB) is a specialized center dedicated to promoting and supporting breastfeeding. Its mission is to collect, analyze, process, store, and distribute donated human milk to patients in need under medical prescription, ensuring its nutritional quality and microbiological safety. The Mexican Network of Human Milk Banks comprises 36 units spread throughout the country. The Hospital Universitario "Dr. José Eleuterio González" is a distinguished high-specialty healthcare center in Mexico, providing services to the northeast region. With 4,402 births attended in 2022, the hospital houses 12 beds in the Neonatal Intensive Care Unit (NICU) and 16 beds in Intermediate Neonatal Care and Growth and Development units. With support from the private sector, resources were acquired in 2019 to establish the "Olga Maldonado de Saldívar" Human Milk Bank, inaugurated on June 16th, 2021.Materials and Methods:Once the budget was secured, the Hospital Universitario "Dr. José Eleuterio González" procured and installed the necessary equipment for the HMB. Expert advice was sought from the National Center for Gender Equity and Reproductive Health (CNEGSR), the regulatory body for the Mexican Network of Human Milk Banks, to comply with national regulations. Personnel were recruited, and their training commenced in July 2021 under CNEGSR supervision. The team comprises 2 Pharmaceutical-Biologist Chemists, a nutritionist, a nurse, an administrative assistant, and a neonatologist pediatrician serving as coordinator. In November 2021, the HMB obtained accreditation from the Mexican Network of Human Milk Banks. The HMB facility spans 110 m² and encompasses a reception area, an office, a storage room, a changing room, a lactation room, and an area for milk processing and preservation. Between November 2021 and June 2023, a total of 378,070 ml of human milk was received, with 347,128 ml being homologous and 30,942 ml heterologous donations. Initially, a 50% loss was reported, but thanks to staff experience and enhanced donor education, this has been reduced to 5.4%. However, 13.4% of the loss is attributed to the milk not being utilized in the NICU due to nursing staff oversight.Conclusions:The "Olga Maldonado de Saldívar" Human Milk Bank is a project on a growth trajectory, aiming to achieve ISO 9001 certification. Additionally, research in human milk has been initiated, seeking to generate new knowledge and enhance the care for patients benefiting from this invaluable resource

COD. P 33

ASSESSING THE RELATIONSHIP OF DONOR AND NEWBORN CHARACTERISTICS WITH THE QUANTITY OF DONATED HUMAN MILK

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INTRODUCTION: According to the World Health Organization (WHO), when breastfeeding is not possible, acquiring donated human milk (DHM) is considered to be the first alternative as compared to milk coming from the own mother. Despite global efforts to promote HM donation, there is currently limited research available on donor characteristics and their influence on the volume donated.

AIMS: To evaluate the donor and their newborn characteristics and to identify associations with the quantity of DHM during the first and second year of the milk bank operation in the Reina Sofia University Hospital of Cordoba (Spain). In addition, we aimed to detect differences between the periods due to the pandemic situation.

METHODS: A cross-sectional study was performed in the first two years of its operation (Annual Period 1 (P1): April 2019 – March 2020; Annual Period 2 (P2): April 2020 – March 2021). Donor age, educational level, employment status, maternity leave, gestational age (GA), parity, birth weight of the child and prematurity were collected. Moreover, we reported the data regarding the DHM volume/day, the total DHM volume for each year and the length of donation. General linear models (GLM) were performed to examine the association of donor and newborn characteristics with the donation volume. All models were adjusted for the length of donation.

RESULTS: A total of 51 and 25 women became HM donors in P1 and P2, respectively. The range of total volume for both periods was remarkably wide (P1: 0.125 – 52.9L; P2: 0.33 – 56.5L). There were no significant differences observed in the mean daily (P1: 84.51 ± 31.61ml, P2: 98.4 ± 60.12ml) or annual volume (P1: 3.4 ± 7.4L; P2: 4.3 ± 11L) between periods, nor in the length of donation, which was very similar with a mean of 4.8 weeks. In the GLM, the length of donation was strongly associated with the volume donated ($p<0.001$ in both periods). Donors with low birth weight infants donated more liters of HM compared to those whose infants had appropriate weight in P1 ($p=0.020$). In P2, women whose GA was between 34 and 36 weeks donated a higher volume vs. those with ≥37 weeks ($p=0.01$). Both associations were regardless of the length of donation.

CONCLUSION: Despite the impact of the COVID-19 pandemic on the number of donors, the volume of DHM remained unaffected. Mothers with preterm/term infants with low birth weight seem to donate a larger volume of HM. Further investigations are needed to identify the key social and clinical characteristics that influence the quantity of DHM.

COD. P 34

DID THE FIRST YEAR OF COVID-19 PANDEMIC AFFECTED OUTCOMES OF NEONATES OF MOTHERS WITH GESTATIONAL DIABETES? – THE RETROSPECTIVE ANALYSIS

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Introduction: The COVID-19 pandemic prompted sudden limitations in ambulatory health care, including also pregnacy menagement. Decline in traditional office-based visits and procedures might have affected the course of the pregnacy of women diagnosed with gestational diabetes and resulted in adverse perinatal outcomes and lower breastfeeding rates. The aim of this study was to evaluate data concerning outcomes of neonates born out of mothers with gestational diabtes in 2020 in comparison to previous years.

Materials and Methods: Medical records of neonates hospitalized after birth in Department and Clinic of Neonatology, Wroclaw Medical University were analysed. The data comprised records of newborns born at term or near term in 2017-2021.

Results: A total of 646 medical records was analysed, 25,5% of which concerned neonates born in 2020. In 2020, approximately 35,2% of mothers reported difficulties in making office-based medical appointments, however no data concerning 2017-2019 were recorded.
In comparison to previous years, significantly more ($p<0.05$) neonates were born in moderate or severe condition, due to the Apgar score. In general, the need of providing oxygen was higher ($p<0.05$), but a significant rise in using non-invasive ventilation rather than passive oxygen therapy was found ($p<0.05$). The higher prevalence of echocardiographic abnormalities ($p<0.05$), birth defects ($p<0.05$) and phototherapy for jaundice treatment was found. The study groups differed significantly ($p<0.05$) in the method of feeding during hospitalization.

Conclusions: The rise in prevalence of perinatal complications was found. Decline in routine care for pregnacies complicated with gestational diabetes might have been a factor affecting general condition of neonates in their adaptational period.

COD. P 35

ANUE CONCEPT - INNOVATVE NEW SOLUTON FOR ENHANCING THE PROCESS OF BREAST MILK DONATON

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Embas Milk Bank Conference provides a unique platorm for healthcare professionals and researchers to gather and exchange knowledge on breast milk donaton and milk banks. In this presentaton, we introduce Anue Concept, a groundbreaking soluton aimed at improving the process of breast milk donaton, thereby enhancing accessibility and quality of donated breast milk.
The first part of the presentaton will provide an overview of the current challenges and limitatons related to breast milk donaton. Despite the invaluable resource that breast milk represents for premature and critcally ill newborns, there are significant barriers that restrict the extent of donatons. Some of these challenges include transportaton, storage, and the risk of contaminaton throughout the process. Anue Concept is developed in response to these challenges, with the goal of enhancing the entre donaton process.
The second part of the presentaton will introduce the key components of the Anue Concept soluton. This includes innovatve methods for sterilizaton and storage of breast milk, ensuring prolonged shelf life without compromising essental nutrients and bioactve components.
The third part of the presentaton will focus on the results from pilot projects and early implementatons of Anue Concept. We will share feedback from healthcare professionals, donors, and recipients who have partcipated in testng the soluton. These insights will shed light on the strengths and potental areas for improvement of Anue Concept, as well as its impact on the breast milk donaton process.
In conclusion, we will summarize the key benefits and opportunites that Anue Concept represents for breast milk donaton and milk banks. By streamlining and enhancing the process, we hope that Anue Concept can contribute to saving more lives and provide healthcare professionals with a valuable tool to ensure the most vulnerable newborns receive the best possible start in life. By atending this presentatin, partcipants will gain insights into a novel and groundbreaking approach to breast milk donaton and understand how Anue Concept has the potental to revolutonize the process and positvely impact newborns and families in need.

COD. P 36

NECROTIZING ENTEROCOLITIS BEFORE AND AFTER DONOR HUMAN MILK BANK. EXPERIENCE OF ONE LITHUANIAN HOSPITAL

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Introduction
Necrotizing enterocolitis (NEC) is a life-threatening illness and one of the most severe diseases of premature newborns. NEC has a mortality rate as high as 50% (1). Research shows that feeding infants with donor human milk instead of formula may reduce incidence of NEC, and modify course of disease. (2,3). A donor human milk bank (DHMB) was opened in Lithuanian University of Health Sciences (LUHS) Hospital Kaunas Clinics, in December 2016 Aim To determine the impact of donor human milk on prevalence, features, and surgical needs of necrotizing enterocolitis.Methods We performed a retrospective study of 135 patients' data. Patients were treated in LUHS Hospital Neonatal intensive care unit in 2010-2021 yrs. Inclusion criteria: 1) gestational age (GA) ≤32 weeks 2) diagnosis of NEC 3) no congenital anomalies of the digestive tract. Patients were divided into two groups - control group (n=73) – treated before DHM was available (2010 – 2016 yrs.), intervention group (n=62) – after DHM became available (2017-2021 yrs.). Groups were compared considering stages and outcomes of disease, surgical needs, duration of parenteral feeding, and need of erythrocyte mass transfusions.
Statistical analysis was performed using IBM SPSS Statistics 27.0. Results were considered significant where p<0,05.

Results
Patients diagnosed with NEC (n=73) composed 7,52% of all patients (n=971) ≤32 weeks GA before DHM was available and 6,51% (n=62) of all patients (n=843) after DHM became available (p>0,05). We found 85,7% (n=18) of NEC-related deaths in the control group, respectively – 60,86% (n=14) in the intervention group (p>0,05). NEC stages varied among groups, however, there was no significant difference.
Average number of NEC-related surgical procedures (0,93±1,17 vs 0,52±0,80) was significantly lower in the intervention group (p=0.020).
Duration of parenteral feeding (8,00±9,45 vs 8,29±5,35) and number of erythrocyte mass transfusions (3,60±3,38 vs 3,11±3,40) did not differ significantly among groups.

Conclusions
According to the statistics, the number of NEC-related surgical procedures was significantly lower once DHM became available. NEC prevalence and stages did not differ significantly among groups, as well as NEC-related deaths. Also, there were no significant differences in erythrocyte mass transfusion numbers and duration of parenteral feeding.

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COD. P 37

EFFECT OF HOLDER PASTEURIZATION ON NUTRIENT CONTENT OF HUMAN MILK: A COMPARISON BETWEEN DRY AND HOT WATER PASTEURIZERS

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Background: Holder pasteurization (HoP) is the method used most frequently in human milk banks to reduce the risk of infection transmission through donor human milk, but it has the disadvantage of potentially affecting certain bioactive milk components.

Objective: The aim of the present study was to determine the effects of HoP on nutrient content of human milk in the case that either dry or hot water pasteurization is employed.

Methods: From April to July 2022, 75 human milk samples were collected from 51 donors. Samples were assigned to 3 groups: Barkey (dry pasteurizer, n=24), Racoon (dry pasteurizer, n=26), and Sterifeed (hot water pasteurizer, n=25). Macronutrients (protein, fat and carbohydrate) were analyzed using a Miris Human Milk Analyzer before and after HoP. Additionally, we measured micronutrients (Ca, IP and Zn) and immune components (sIgA and lactoferrin) using a colorimetric reagent and enzyme-linked immunosorbent assay kits, respectively. The processing temperature of each machine was measured over time.

Results: Macronutrients and micronutrients were found to be only minimally affected by the HoP process in trials with both types of pasteurizers, whereas the sIgA and lactoferrin levels were decreased significantly. The use of a dry pasteurizer resulted in a 10% greater reduction in immune components compared with a hot water pasteurizer, and percentage reductions in Barkey, Racoon, and Sterifeed were 44, 44, and 31% for sIgA and 86, 89, and 76% for lactoferrin, respectively. Furthermore, a dry pasteurizer had a higher mean heating temperature and required a longer time to cool to 10 °C after heating than a hot water pasteurizer. Therefore, we reduced the cooling time of the dry pasteurizer and re-measured milk components, but reducing the dry pasteurizer cooling duration did not improve the retention of the immune components.

Conclusions: These results suggest that several milk components increase or decrease with HoP and that cooling time may not affect the reduction in immune components. In future, it will be necessary to assess changes in milk components in conjunction with various pasteurizers using a common heating time and temperature, to determine whether variations in these parameters are responsible for differences in the losses of specific components.

COD. P 38

PARENTS IN NEONATAL INTENSIVE CARE UNIT & HUMAN MILK BANK: A DIFFERENT PERSPECTIVE

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Introduction: Giving birth of a full–term infant is a joyful but also stressful event for families, as the already existing balance is "modified".
Family should redefine the "roles" and adapt to a new lifestyle. Especially, the preterm birth of an infant, and especially of a very low birth weight (VLBW) one, requiring intensive care in NICU, that consists of early parent separation, may induce additional stress and increase the risk of postpartum depression. The negative emotions, anxiety of an uncertain outcome for their infants makes them fragile and negatively affects the process of parental bonding, that certainly takes place during this period. Bonding is interrupted when neonates are hospitalized during the early days or months of life in NICU.

Objective: The present study aimed to determine the anxiety and depression levels of parents of VLBW infants,hospitalized in NICU and define the related factors.

Method: This, prospective observational follow up–cohort study was conducted in the NICU of "Helena Venizelou" Maternity Hospital, Athens between 1/12/2019 to 31/12/2022. The sample consisted of 60 parents, who gave birth to VLBW infants with BW<1750 g and GA<34 w. Data were collected using: the C. D. Spielberger Anxiety Scale (STAI) to screen anxiety and the Edinburgh Postpartum Depression Scale (EPDS) for symptoms of depression. The 1st timepoint was conducted in 3rd–4th day of labour, 2nd in 20th–25th day and finally 3rd, just before infants discharged the NICU. All infants included in the study were fed with their mothers' raw milk plus pasteurized donors' human milk.

Results: Our data showed that the rate of maternal depression decreased significantly in the 3rd timepoint (40.0%) compared to 1st (73.3%) and 2nd (56.7%). In addition, fathers' depression rate decreased in the 3rd timepoint (16.7%) compared to 1st (38.3%). The STAI score for state anxiety in mothers was significantly higher in the 1st timepoint (Mean±SD:52.2±11.9) compared with 2nd (Mean: ±SD:47.8±12) and 3rd (Mean:±SD:49±10.3).There was similar variation in the STAI score for trait anxiety, where it was recorded as significantly higher in the 1st timepoint (Mean±SD:46±14.6) compared to 2nd (Mean±SD:41.9±16) and 3rd (Mean±SD:42.8±13), ($p<0.05$). The anxiety in the 3rd timepoint of mothers was at the same level as 2nd. Also, the STAI score for state anxiety in fathers was significantly higher on the 3rd–4th day of life (Mean±SD:47.1±12.2) compared to the other two timepoints (2nd–Mean±SD:42±9.8/3rd–Mean±SD: 41.7±9.1) respectively, ($p<0.01$), while trait anxiety wasn't significantly changed.

Conclusion: NICU is a stressful place for both parents. It might be useful to establish and plan, as soon as possible, Interdisciplinary Perinatal Support Groups and Interventions to help parents, through the experience of premature birth of their infants, to begin immediately adaptive mode of care, for healthy families and thus societies would be born.

COD. P 39

IMPACT OF THE TIMING OF ENTERAL FEEDING INITIATION ON SHORT-TERM OUTCOMES IN EXTREMELY LOW BIRTHWEIGHT INFANTS

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Background: In countries outside of Japan, the standardization of enteral feeding for extremely low birthweight infants (ELBW) has been achieved through the use of donor human milk (DHM) from an early stage after birth, which has led to improved outcomes. In Japan, a public human milk banking was established in 2017, and a registry initiated. This study examines the relationship between the early enteral feeding and short-term outcomes in ELBW.Subjects and methods: 135 ELBW in the registry by 2022 who began receiving enteral feeding within 24 hours of birth through DHM were included. The incidence of retinopathy of prematurity (ROP), chronic lung disease (CLD), and necrotizing enterocolitis (NEC) were compared with those of 2,782 high-risk newborns registered by the Japanese Pediatric Society in a 2015 survey. Further, the information on the establishment of enteral feeding was compared with those of 1,093 cases by the Neonatal Research Network.Results: Enteral feeding was initiated significantly earlier. The median initiation time was 2 days earlier. A reduction in ROP requiring treatment was observed when enteral nutrition was established early ($p<0.01$). No significant difference was observed in the incidence of CLD. Similarly, no significant difference was observed in the incidence of NEC.Conclusion: Early enteral feeding in ELBW does not result in the deterioration of their condition. Instead, it expedites the establishment of enteral feeding and may reduce the incidence of ROP requiring treatment. Further research involving more cases is necessary to accumulate greater evidence for the initiation of enteral feeding.

COD. P 40

COMPARISON OF THE ENZYMATIC METHOD WITH THE ION CHROMATOGRAPHY ANALYSIS FOR MEASURING MINERAL CONTENT IN HUMAN MILK

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Objective: Calcium (Ca) and phosphorus (P) in human milk are representative components involved in bone metabolism and are essential for child growth. Own mother's milk (OMM) is the best nutrition especially for preterm infants, however, if OMM is not available, donor human milk (DHM) is the best alternative. Therefore, the mineral content in DHM is important, but the conventional method of measuring minerals in DHM is time-consuming, costly, and complicated. In this study, we measured the amount of minerals in DHM using two methods: the conventional method and the enzymatic method, which is a simpler and newer technique. Then we compared the correlation between the results of the two methods.

Methods: 19 DHM samples provided by 19 donors and pasteurized from March 2022 to June 2022 were subjected to this study.Ca and inorganic phosphorus (IP) concentrations were measured by the ion chromatography (IC) and the enzymatic methods using an automated biochemical analyzer, and the correlation between the two measurement methods was examined. This study was approved by the Showa University Ethics Committee.

Results: Ca concentrations ranged from 20.43 to 35.42 mg/dL by the IC method, and from 20.93 to 38.25 mg/dL by the enzymatic method. The two assays showed a strong correlation at $r=0.95$ ($p<0.001$), with a regression line of $y=1.08x-1.85$.IP concentrations ranged from 2.12 to 5.92 mg/dL for the IC method and from 3.48 to 6.93 mg/dL for the enzyme method. The correlation between the two methods was $r=0.77$ ($p<0.001$), and the regression line was $y=0.68x+2.26$.

Discussion: There was a correlation between the IC and enzymatic methods for Ca and IP concentrations in DHM, and the strong correlation for Ca concentration indicates that Ca concentration can be measured by the enzymatic method. In the future, it will be necessary to investigate the correlation between the enzymatic method and the inductively coupled plasma (ICP) analysis method. The enzymatic method used in this study calculates only IP from the change in absorbance of reaction products, but the ICP method is widely used in food analysis and in the measurement of minerals in human milk, and can also measure total phosphorus (T-P) including organic phosphorus. Through this future research, T-P concentration in DHM may be calculated by the enzymatic method to simplify the measurement. The enzymatic method is superior to the conventional methods for measuring minerals in human milk in terms of cost, time, amount of sample used, and simplicity of the process. Clinical application of the enzymatic method is expected to provide appropriate DHM for preterm infants.

COD. P 41

EFFECT OF MICROWAVE HEATING ON BREAST MILK COMPONENTS

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Background: Thawing frozen breast milk by microwave (MV) is not recommended because of the loss of sIgA and temperature variation. However, recent studies have shown that the loss of sIgA, lactoferrin, vitamin E, vitamin B1, neurotrophic factor, fat, and carotenoids in breast milk is not significant. Also, the effect of MV heating on breast milk components has not been fully elucidated.

Objective: The aim of the present study was to determine the effects of MV heating on human milk composition and temperature variation after heating.

Methods: From January to April 2023, human milk samples were collected from 17 donors. Samples were frozen in two types of 25ml storage bag that made of polypropylene (PP) and polyethylene (PE) after 75 seconds of sonication, 75 seconds of homogenization, or without operation, and then thawed with MV (600W 30s). After MV heating, the temperature of samples was immediately measured with a thermal imaging camera. The temperature variation was evaluated as maximum minus minimum temperature. Macronutrients (protein, fat, carbohydrate and energy) were analyzed using a Miris Human Milk Analyzer. Additionally, we measured immune components (sIgA and lactoferrin) using enzyme-linked immunosorbent assay kits. This research was approved by ethics committee of Showa University hospital (Tokyo, Japan).

Results: Temperature variation was considered in terms of bag material and operations before MV heating. In bag material, the median (IQR) of temperature variation was 49.5 (34.3-60.0) for PP bags and 42.0 (28.9-53.3) for PE bags, significantly smaller with PE bags ($p=0.027$). In operations before MV heating, the median (IQR) of temperature variation was 29.0 (22.4-40.1) for sonication, 51.5 (42.3-58.0) for homogenization and 54.0 (43.9-60.7) for without operation, significantly smaller with sonication ($p<0.01$). For milk components, lactoferrin was significantly decreased by MV heating ($p=0.019$), but there were no significant decreases in sIgA ($p=0.11$), protein ($p=0.068$), fat ($p=0.098$), carbohydrate ($p=0.49$), and energy ($p=0.21$).

Conclusions: MV thawing is considered feasible because it was possible to minimize the temperature variation by the material of storage bags or the operation before MV heating, and no decrease in macronutrients and sIgA was observed.

COD. P 42

A NEW METHOD OF HUMAN MILK PRESERVATION: STORAGE IN UNFROZEN STATE UNDER HIGH PRESSURE-SUBZERO TEMPERATURE CONDITIONS

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The overriding objective of human milk banks (HMB) is to provide access to natural, safe and high-quality donor milk to infants who need it most. The flagship method of preserving donor human milk (HM) is still holder pasteurization (HoP), which ensures microbiological safety, but has a significant negative impact on some milk components. The reduction in HM quality is related not only to the HoP process itself, but also occurs as a result of repeated freezing and thawing of milk during the normal procedure carried out in HMB. Simplification of the procedure could significantly improve the quality of the milk. One of the more promising milk pasteurization techniques is high pressure pressurization (HPP). Scientific studies have repeatedly shown that pressurization (at 500-600 MPa) leads to the desired inactivation of microorganisms and at the same time affects many components of human milk in a much more gentle way than HoP. However, it is problematic to carry out this process in HMB because generating such high pressure requires the use of expensive equipment with dimensions usually unacceptable in HMB.

Therefore, the aim of the presented project is to create a scientific basis for developing an alternative procedure for preservation and storage of HM, which will minimize the loss of nutrients and biologically active components. A prototype of the device, which allows for the storage of milk samples with a volume of 50-150 mL, under a pressure of 60-150 MPa at a temperature below 0 °C in an unfrozen state was designed and built. Under these conditions the microorganisms in the HM are reduce to an undetectable level, i.e. < 10 CFU/ mL, and at the same time the nutritional value and biological activity of the milk is preserved to a greater extent than in the standard operating procedure of HM processing. The use of appropriate conditions of moderate pressure at a temperature below 0°C for HM storage allows the elimination of the pasteurization process and the two-step freezing/thawing of milk, so may be a desirable alternative method to the procedure currently used in HMB.

The research was carried out as part of the HumMilkPres project (contract number NOR/SGS/HumMilkPres/0009/2020-00) funded by Norway Grants

COD. P 43

THE HTST PASTEURIZATION OF HUMAN MILK REALIZED BY CONVECTION HEATING AND MICROWAVE HEATING

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The high temperature short time (HTST) pasteurization method is based on using high temperature (72.5 °C) for a short time (5 – 15 s). The HTST pasteurization (72 °C, 15 s) can be successfully used as an alternative to the holder pasteurization (62.5°C, 30 min) of human milk (HM) in Human Milk Banks (HMB). This method is, at least, equivalent to HoP in terms of ensuring milk microbiological safety while is better at preserving the functionality of its biologically active components. An increase of the temperature in the HTST method is most often performed by classic convection heating but may be obtained by microwaves. Convective HTST (CHTST) is usually carried out in flow pasteurizers employ mechanisms of convectively heat-transfer obtained from steam or hot water. The microwave-assisted heat treatment results from the conversion of electromagnetic energy into thermal energy through increased rotation of water molecules and ions. Since the microwave field allows to achieve a high temperature of matters containing water in a very short time it can be used to perform HTST (MHTST) pasteurization both, for food products and HM. This study presents a comparison of the HTST pasteurization (72 °C, 15 s) of HM using two heating methods: convection and microwave under identical heating/cooling profiles. The aim of the study was to check whether the use of microwave heating to HTST pasteurization affects the constituents of human milk in a different way than convection heating. Several components representing the complexities of HM were selected as indicators of milk quality. The nutritional quality of HM was detected on the basis of the fat content, fatty acids (FAs) profile, and content of malondialdehyde (MDA) as a marker of lipid oxidation.
Lysozyme activity (LZ), lactoferrin (LF) and vitamin C contents as components supporting the immune system and a-amylase (a-A) activity as one of digestive enzymes present in HM were determined. Antioxidant properties quality of milk by total antioxidant capacity tests and vitamin C content was measure. Due to their sensitivity to high temperature, vitamin C and LF also served as markers of heat treatment.
Regardless of the used heating methods the total fat and FAs content, LZ activity and antioxidant properties of HM proved to be insensitive to HTST treatment in contrary to vitamin C. The concentration of vitamin C was decreased by 42.6 % and 50.2 %, and activity of a-A by 6.0 and 7.2 % for MHTST and CHTST, respectively. LF content changed significantly only in case of CHTST (42.3 % reduction). There were no negative effects of microwave heating under controlled conditions on the other HM components tested compared to convection heating. However, further studies are needed to confirm the safety of using MHTST to pasteurize human milk.

COD. P 44

EFFECT OF THAWING TIME ON DONOR HUMAN MILK COMPOSITION AT 24 AND 48 HOURS

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Background: While human milk banks in japan stipulate that donor milk (DHM) be used within 24 hours of thawing. On the contrary, some human milk banks in other countries use up to 48 hours after thawing. Although there have been reports measuring bacterial counts after DHM thawing, no studies compared how major nutrients, micronutrients, immune substances, and pH are affected by the time course after thawing.
Objective: This study aimed to compare the components of DHM after 24 and 48 hours of thawing and utilize them as evidence for the revision of the Japanese guidelines for human milk banking.
Methods: A total of 20 DHM samples that had been pasteurized from May to October 2022 were refrigerated and thawed, and the concentrations of bacteria, major nutrients (protein, fat and carbohydrate), micronutrients (Ca, IP and Zn), and immune substances (sIgA, lactoferrin) were measured immediately after pasteurization, at 24, and 48 hours after thawing. The pH was also measured 24 and 48 hours after thawing.

Results: After 48 hours of DHM thawing, no bacteria were detected. Comparisons after 24 and 48 hours of thawing showed no differences in the key nutrients, Zn, or immune substances. On the other hand, inorganic phosphorus(IP) was significantly increased at 48 hours versus 24 hours. Compared to immediately after pasteurization, protein (0.77 g/dl immediately after, 0.87 g/dl after 24 hours, and 0.89 g/dl after 48 hours), carbohydrates, and immune substances were significantly increased at both 24 and 48 hours, while Ca was significantly decreased only after 24 hours.
Conclusions: Human milk banks in japan confirmed that all DHMs had 0 CFU/mL of bacteria after pasteurization treatment, and no bacteria were present after refrigerated thawing. The significant increase in protein, carbohydrates, and immune substances should be verified with more samples in the future. No reduction in macro and micronutrients, immune substances, or pH was observed, suggesting that DHM may still be used within 48 hours of thawing.

COD. P 45

DOES THE STERILIZATION OF HUMAN MILK BY HOLDER PASTEURIZATION (HOP) OR HIGH HYDROSTATIC PRESSURE (HHP) PROCESSING EXERT DIFFERENTIAL INTESTINAL EFFECTS IN GROWTH-RESTRICTED MOUSE PUPS

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Introduction:
Human milk banks (HMBs) provide donor milk (DM) as alternative for the feeding of preterm infants when mother's own milk is not available or is in short supply to meet the nutritional requirements of these newborns. To ensure the microbiological safety of DM, DM is sterilized using the standard method of Holder pasteurization (HoP) performed by heating DM at 62.5°C for 30 minutes. However, a growing number of studies show that HoP reduces some nutritional compounds of DM and degrades numerous heat-sensitive, bioactive factors (immunoglobulins, lactoferrin, some vitamins, lysozyme, the bile salt-dependent lipase (BSSL), several hormones and growth factors. Recently, high hydrostatic pressure (HHP) processing was proposed as an alternative to HoP as this method preserves numerous bioactive factors that are degraded by HoP, but no data are available in vivo. Our study aims to evaluate in postnatally growth-restricted mice subjected to a daily oral administration of HoP- or HHP-DM, if these two types of sterilized DM have differential intestinal effects.
The early postnatal growth, the intestinal morphology and the gene-expression level of some markers of intestinal barrier integrity were measured.

Materials and methods:
A pool of DM from 8 donors (Lille HMB, CHU Lille) was divided in two batches. One batch was subjected to HoP and the second was subjected to HHP processing (4 cycles of 5 minutes with a pressure of 350MPa at 38°C). Postnatal growth restriction (PNGR) was induced in FVB/NRJ mice by increasing litter size from 8 to 15 pups per mother at postnatal day 4 (PN4). From PN8 to PN20, pups were treated by daily oral gavages with HoP- or HHP-DM (5 mL/kg). Body weight was measured until weaning. At PN21, male pups were sacrificed and jejunal, ileal and colonic tissues were collected. Intestinal morphology was analyzed and gene expression level of some intestinal markers were measured by RT-qPCR.

Results:
Mice pups supplemented with HHP-DM had increased body weight from PN12 to PN21 compared to HoP-DM pups. However, no differences of intestinal morphology in the small intestine and colon as well as no alterations of gene expression of some intestinal barrier markers (tight junctions, digestive enzymes, mucine-2, lysozyme) were observed between groups.

Discussion and conclusion:
We demonstrated that DM treated by HoP or HHP is well tolerated in developing mice with growth-restriction. HHP-DM enhances the early postnatal growth until weaning compared to HoP-DM. This effect may implicate the preservation of several bioactive compounds in HHP-DM (hormones, growth factors, enzymes...). HoP-DM and HHP-DM have similar intestinal effects in the small and large intestine of developing mice. A forthcoming study will examine the microbiota in these mice pups.

COD. P 46

COMPARISON AND EFFICACY OF BREAST PUMP CLEANING TECHNIQUES FOR BIOBURDEN REDUCTION

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Background: Donor milk is a good alternative for premature babies whose mothers cannot breastfeed. To reduce the risk of milk contamination, donors have to follow some hygiene instructions, including disinfecting their breast pump (BP). Although these products have been available for many years, experimental data are missing to justify the frequency and methods of cleaning and decontamination necessary to ensure their safety, despite multiple uses.This study aims to investigate the efficacy of BP cleaning and disinfection methods.

Methods: Contamination of BP parts was performed by passing milk inoculated with Bacillus cereus, Staphylococcus aureus, or Escherichia coli, through BPs. Devices were then rinsed with cold water or cleaned with hot soapy water. Disinfection was achieved using either a microwave or by immersing BP parts in boiling water. After treatment, residual bacteria were recovered by passing sterile phosphate buffer saline (PBS) through BPs before being inoculated on plates and performing bacterial counts. Method efficiency was assessed by comparing BP residual bioburden to results obtained from BPs that have not undergone cleaning or disinfection treatment (controls).

Results: Experiments of contamination of BPs with about 10e5 CFU/mL of E. coli and B. cereus spores, and about 10e4 CFU/mL of S. aureus, showed that rinsing with cold water reduced the number of pathogens, but did not remove all bacteria from the pump parts. Cleaning with soapy warm water and brushing the BPs revealed to be efficient enough to reduce bacterial load to undetectable level on each type of the devices tested. The disinfection of BP parts not previously cleaned was incomplete when using a microwave, following contamination with spores of B. cereus, reaching up to 3.58 colony-forming unit/mL of sporulating B. cereus in PBS eluted from the pump parts. The use of boiling water, with or without cleaning step, removed bacteria to a level such that no residual contamination was observed (median of 0.0 CFU/mL), whatever the pathogens used for contamination of devices.

Conclusions: Using a microwave to reduce the bacterial load should not replace the cleaning of the pump parts with soapy warm water. Boiling alone, without prior cleaning of the pump parts, or cleaning BP parts in hot soapy water followed by a disinfection in boiling water ensures a complete decontamination of the BP. These results give evidences for instructions to milk bank donors for whom reducing risks of infections to minimal level is essential.

COD. P 47

INTRA-DAY AND INTER-DAY CHANGES IN THE AMOUNT OF CYTOMEGALOVIRUS IN HUMAN MILK

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Background: Breast milk is an optimal source of nutrition for preterm infants, but it can also be a source of cytomegalovirus (CMV) infection. Several studies have reported that the amount of CMV in breast milk increases from 1 to 8 weeks of age, and then decreases. However, most of them compared milk samples collected every few weeks from multiple mothers.
Objective: The aim of the present study was to compare the amount of CMV-DNA in breast milk of the same person within and between days.
Methods: Three mothers' breast milk (subject A, B and C) stored at the NICU of Showa University Hospital were selected as milk samples (n=38). These samples were collected on multiple days over a short period, and we examined inter-day change. Subject C expressed breast milk several times during a day, then we also compared intra-day change. In addition, pooled samples of subject C within 36 hours were analyzed to determine long-term trends. CMV-DNA analysis was performed by real-time PCR. This study was approved by the Showa University Ethics Committee.
Results: In Subject A, the amount of CMV-DNA ranged from 1000 to 10000 cp/mL through 1-7 weeks of age, but decreased below the detection limit (160 cp/mL) at 6 and 7 weeks of age. In subject B, the amount of CMV-DNA also remained between 100-1000 cp/mL through 1-8 weeks of age, but decreased below the detection limit at 6 weeks of age. Pooled sample of subject C showed a gradual increase from 1-4 weeks of age, and then decreased gradually until 10 weeks of age. However, when we compared individual samples of subject C until 16 days of age, there was a gradually increase with repeated increases and decreases.
Conclusions: These results suggest that the amount of CMV-DNA in breast milk shows significant increase and decrease when compared within and between days. Further studies are needed to confirm these results.

COD. P 48

A SENSITIVE, HIGH-THROUGHPUT FLUORESCENT METHOD TO DETERMINE ACTIVITY OF BILE SALT-STIMULATED LIPASE IN HUMAN MILK

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Background: Bile salt-stimulated lipase (BSSL), one of the two identified lipases in human milk, plays an important role in lipid digestion and absorption by infants. Over 50% of the dietary energy requirements of infants are met by lipids. BSSL activity is very important in human milk, particularly for premature infants, where the immature pancreas may be unable to supply sufficient pancreatic lipase. Traditional methods for BSSL measurement are complex and/or not sensitive. This study, thus, aimed to develop and validate a sensitive fluorescence method for the measurement of BSSL activity.

Methods: BSSL activity was measured based on the hydrolysis of a lipase substrate 1,2-Di-lauryl-rac-glycero-3-glutaric acid 6-methylresorufin ester. Optimization of detergent concentration, substrate concentration and bile salts concentration were conducted. The effect of different pasteurisation methods, Holder pasteurization (HoP) and high-pressure processing (HPP), on the BSSL activity in human milk were also analyzed.

Results: The optimized concentrations of detergent (Triton X-100), substate and bile salts were 0.0156%, 10 mg/mL and 50 mg/mL, respectively. The limit of detection for BSSL in human milk was 1.46 U/mL and the between run and within run validated this assay method. No BSSL activity was detected after Holder pasteurization and there was no significant difference of BSSL activity between raw milk and high-pressure processed milk.

Conclusions: A reliable, novel assay to determine BSSL activity in human milk was developed. The method could distinguish between the BSSL activity in raw, HoP and HPP processed milk, showing complete loss for BSSL activity in HoP samples.

COD. P 49

THE IMPACT OF THE COVID-19 PANDEMIC ON EXCLUSIVE BREASTFEEDING RATES IN A BABY-FRIENDLY HOSPITAL IN ATHENS, GREECE

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Introduction: During the COVID-19 pandemic, precautionary measures were adopted at the "Elena Venizelou" Maternity Hospital, to prevent the transmission of the virus. The precautionary measures referred to the management of both, women, who attended the hospital to give birth, as well as their attendants and the rest family or friends visitors. Aim: The purpose of this study is to record the percentages of exclusive breastfeeding and to highlight the effect of the COVID-19 pandemic on the percentages of women who chose to exclusively breastfeed their newborn right after birth and those analogies of women that kept on breastfeeding upon leaving the Maternity Hospital. Method: According to the practice of daily recording, as it is systematically conducted, in certified Baby Friendly Hospitals, the evaluation of the exclusive breastfeeding rates is performed monthly, as well as the recording of the proportions of the mothers who started to exclusively breastfeed their newborn during the 1st hour of life and ended up breastfeeding exclusively upon leaving the Maternity Hospital. At the same time, the proportions of infants who were fed with breast milk substitute based on a medical indication were also recorded. This study concerns full-term infants born at the "Elena Venizelou" Maternity Hospital during the years 2019-2022, with gestational age >37 weeks. Exclusive breastfeeding indicators were estimated due to the formal type defined by WHO for Baby Friendly Hospitals. Results: The study included: -3374 full-term newborns born in 2019, -3667 full-term newborns born in 2020, -3304 fullterm newborns born in 2021, and -3297 full-term newborns born in 2022.During 2019, the analogy of the newborns, who were exclusively breastfed at discharge, compared to those ones who started breastfeeding from the first hour of life, was 61.5%. Respectively for year 2020, 49.9%, for year 2021, 55.4% and for year 2022, 54.6%. Exclusive breastfeeding rates, due to WHO, considering the medical reasons for providing formula, were during 2019, 81.6%, 2020, 78.5%, 2021, 82.5% as well as for year 2022. 81%.Conclusions: During the beginning of pandemic of COVID-19, as it was estimated, there was a slight decrease of the indicator of exclusive breastfeeding, that was later diminished and rates increased during the following years 2021-2022. Those conclusions are probably owedto the «reservation» and inexperience of the management of the pandemic by healthcare providers, and on the other hand are probably due to the lack of knowledge and the feeling of panic on behalf of new mothers concerning the care of their newborns during pandemic. Our policy insisted on promoting exclusive breastfeeding even in covid-19 positive mothers, continuing rooming-in and exclusive raw or pasteurized human milk feeding combined with breastfeeding in NICU for the preterms. Breastfeeding rates decrease recovered and indicators remained stable during the epidemic outbreak until nowadays.

COD. P 50

INTEGRATED BREASTFEEDING AND FORMULA MANAGEMENT IN HOSPITAL

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INTRODUCTION

According to the World Health Organization (WHO), breastfeeding is the optimal way to feed a newborn, as it provides all the nutrients and defenses necessary for their correct development. However, in the Neonatology Services (NS), there are special situations in which some babies cannot receive milk from their own mothers. In such cases, donated breast milk from a bank becomes the best alternative to nourish the baby.

OBJECTIVES

To analyse the number of breastmilk and artificial formula preparations made in our hospital.

MATERIAL AND METHODS

Between April and May 2023, we conducted an observational study of the integrated co-management of breastfeeding (BF) and artificial formula preparations (AF) made in the Nutritional Support Unit – Baby feeding area (USN- Baby feeding area) and the preparations done in the NS, responsible for the management of the milk bank. Preparations were classified into two main groups: AF and BF. Of the latter, two subgroups were made: deferred breast milk and donated milk.

RESULTS

All 1033 preparations for patients admitted to NS were studied. Mean age 28.5 weeks of gestation (range: 25-32). 70,1% of the preparations were made with BF, 62.56% of which consisted of donated breast milk (NS management) and only 29.9% were AF. Thanks to donated milk, we observed an increase in BF preparations.

CONCLUSIONS

Due to comprehensive management and use of milk from the milk bank, a decrease in artificial formula preparations and an increase in breastfeeding in our hospital was observed.

COD. P 51

HUMAN MILK BANKING DURING THE COVID_19 PANDEMIC PERIOD IN GREECE

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Introduction: Human milk (HM) remains the most preferable nutrition for newborns. Mother's own raw milk is widely recognised as the ideal nutritional source for optimal infant health. Its' unique composition is essential for preterm infants, as significantly reduces the risk of serious complications related to prematurity and improves long-term neurocognitive development. When mother's raw milk is insufficient or not available, the best alternative remains donor pasteurized human milk (DHM) feeding, which is collected and processed in a Human Milk Bank (HMB). The period after COVID_19 has upended our societies and temporarily changed the way we go about our daily lives. As a consequence, human milk banking has been heavily affected and as underlined in the articles of Marinelli (2020) and Furlow (2020), COVID_19 has imposed a negative impact on HM donation and HM banking.

Aim: The aim of the study was to refer to the operation of the first, in Greece, HMB during the COVID_19 period.

Method: The study was conducted in "Helena Venizelou", Maternity Hospital, Athens, Greece. Data recorded were: HM amounts (lit) collected from 01-01-2018 to 30-06-2023, The number of donors from middle and south Greece and The number of pasteurisations conducted in that period.

Results: During the study period (2018 – first 6 months of 2023) a decrease has been marked in the quantities of HM treated in our HMB. In particular, in 2018 we collected 1.799 lit of HM, (754 lit mothers' raw milk & 1.045 lit donors' HM), the number of donors was 109 and we conducted 62 pasteurisations. During 2019 we collected 1440 lit of HM, (755 lit mothers' raw milk & 685 lit donors' HM), the number of donors was 99 and we reached to 50 pasteurisations. In 2020 we collected 1452 lit of HM (602 lit mothers' raw milk & 850 lit donors' HM), the number of donors was 81 and we performed 50 pasteurisations. In 2021 we collected 1351 lit HM (686 lit mothers' raw milk & 665 lit donors' HM) the number of donors was 74 and pasteurisations were 53. During 2022 we collected 1104 lit of HM, (479 lit mothers' raw milk & 625 lit donors' HM), the number of donors was 70 and pasteurisations were 45. Finally, during the first 6 months of 2023 we collected 445 lit of HM, (203 lit mothers' raw milk & 242 lit donors' HM), the number of donors was 32 and we already have 23 pasteurisations. Differences in both quantities of raw and donor human milk, number of donors and pasteurizations were statistically significant through the years 2018-2023 ($p<0.005$, $p=0.001$, $p<0.002$ & $p<0.005$, respectively). All infants (100%) in NICU were fed with mothers' raw milk combined with pasteurised donors' milk under singed parental consent.

Conclusion: Healthcare professionals have faced many challenges and different dilemmas during COVID_19 pandemic and human milk feeding for vulnerable preterm infants has been the greatest challenge. Human milk banks remain the bridge to support exclusive breastfeeding, with positive clinical and psychological advantages for both mother and infant, especially in such a period of crisis.

COD. P 52

DIGITIZING NEWBORN NUTRITION DATA: IDENTIFYING REQUIREMENTS FOR HUMAN MILK BANKING AND CLINICAL NEWBORN NUTRITION DATA INFORMATION SYSTEMS

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Background: The digitization of health systems has revolutionized the way that we capture and use health data, from planning and monitoring health service delivery to supporting clinicians at the point of care by making the right data available at the right time to the right people. Newborn nutrition information systems have great advancement opportunities to build on global digitization momentum to ensure optimal lactation support and human milk feeding outcomes, yet a lack of common data standards and siloed systems for neonatal nutrition and human milk banking make it very difficult to effectively use and share information. Globally there are over 700 milk banks, yet very little is known about the handling, distribution, and use of donor milk. Likewise, there is no known global data source seeking to profile how admitted small and sick newborns are fed globally. The gaps in these data have ultimately contributed to a hidden problem in the feeding of the most vulnerable neonates globally.

Methods: Aligning with global standards, PATH set out to create recommendations and minimum standards for digitizing newborn nutrition and maternal lactation data systems with the ultimate goal of improving available statistics of current feeding practices, advance how systems communicate and cooperate, and improve decision making around early feeding needs that improve long-term lactation and nutrition goals. PATH performed a series of requirements gathering exercises, including reviews of human milk bank (HMB) and clinical newborn nutrition systems, documents review, hosting a systems requirement mapping workshop among global leaders in human milk banking and newborn feeding, and interviews with key stakeholders. The goal of these exercises was to identify common stakeholder challenges, lessons learned, potential solutions, and key priorities across human milk banking practices and newborn feeding and maternal lactation systems.

Results: Common challenges in current data systems were identified including the need for maintaining confidential donor and patient information, the need for traceability of donations from donor to recipient to ensure patient safety and the need for common data standards to support enhanced sharing of data between authorized users. Additionally, minimum systems requirements were identified for HMB and newborn nutrition information systems, and recommendations on best practices for designing digital information systems across the maternal newborn child health pathway were produced.

Conclusion: The data system requirement framework identified will serve as a guide for the advancing data systems for improving newborn outcomes. Continued coordination across systems and technology advancements will be required to see ultimate change for improved impact. These recommendations could be weaved into broader global recommendations for establishing systems for optimizing care for the small and sick newborn.

COD. P 53

BEING A BREAST MILK DONOR WITH BLINDNESS: A POSSIBLE CHALLENGE

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Justification:Blind people may have difficulties accessing available information on how to become a breast milk donor. The cleaning of the breastmilk pumps, or the proper storage and traceability of the milk may be at risk for this type of donors.The planning and development of an interview adapted to a candidate with total blindness as a potential breast milk donor are presented. Analyzing the process after the first experience allows us to identify the areas for improvement in the procedure, considering the candidate's unusual physical condition.

Objective: To share the experience of recruiting and accepting a donor with blindness to analyze the points that can be modified and adapted in the interview and training process, while assessing the potential risks or difficulties in the milk extraction practice for donation.

Methodology: During a screening telephone interview, a potential donor disclosed her blindness and expressed her desire to contribute to milk donation.A tailored approach was planned to meet the needs of the potential donor, including the use of a summary of the infographic transcribed into Braille and tactile communication to ensure proper handling of the extraction equipment according to the criteria of the Regional Milk Bank.In the days following her acceptance and after ensuring compliance with the inclusion criteria, it was determined that ongoing support and follow-up were necessary to address any unforeseen difficulties specific to the candidate's condition.

Results: An interview was conducted with a potential blind donor. Suitability for donation was confirmed, as well as understanding of the provided instructions. Practice was taken place during the interview on hand hygiene, cleaning, use, and drying of the breast pump, and any questions that arose were addressed, including the provision of a brief infographic transcribed into Braille regarding the donation process. After the visit, the donor reported feeling satisfied and supported in her donation efforts.Following her first donation batch (1 liter of donated milk), the milk met quality criteria with a sterile microbiological culture, acidity of 5º Dornic, fat content of 5.97g, protein content of 0.99g, lactose content of 7.81g, and caloric content of 80.83 Kcal.

Conclusions: In the case of a potential donor with blindness, it is recommended to adapt the provided information into Braille for breast milk donors to ensure equal access and information. It is considered essential to include a practical demonstration during the interview, covering the handling of the breast pump, cleaning, and drying of its parts, to ensure the donor's autonomy. Finally, it appears appropriate to provide closer follow-up for this type of donor to address any doubts that may arise during the donation process.

COD. P 54

COMPARATIVE ANALYSIS OF THE NUTRITIONAL VALUE OF MATURE DONATED HUMAN MILK UP TO 12 MONTHS OLD AND OLDER THAN 12 MONTHS

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INTRODUCTION

Optimal nutrition is crucial for the favorable development and growth of premature babies. Human milk is the ideal source of nutrients, but its composition is highly variable. The macronutrient content of donated human milk (DHM) varies in the different periods of lactation. Mature milk is characterized by being the richest in fat content.There is no consensus on the time limit to donate, some milk banks in the world limit the donation time to 6 or 12 months of life of the infant, due to the fact that for the nutrition of very premature newborns, the concentration of protein is key and there is a progressive decrease in its content as lactation time increases. In our bank until the end of 2019, it was limited to 12 months, after conducting a review of the literature; it was decided not to limit the time to donate.

AIM

Assess the possible variations in nutritional value between the mature DHM of up to 12 months and the DHM of more than one year after the modification of the expiration date of the DHM in our bank.

MATERIALS AND METHODS

We retrospectively analyzed the nutritional value, that is, energy, fat, protein and, lactose, of a sample from each batch of pasteurized and thawed DHM for the period from December 2019 to June 28, 2023, using the MilkoScan analyzer FOSS Mars. To carry out comparisons, we established two groups: mature milk of up to 12 months and mature milk of more than 12 months.The data was obtained from the GALA computer application and the statistical analysis of the obtained data was performed using the Student's t-test for quantitative variables, using the SPSS program, a $p<0.05$ was considered significant.

RESULTS

The results can be seen in the attached table.

	DHM Type	N	Mean	SD	p
Energy (Kcal/100 mL)	<12 months	3042	57.57	92.93	0.489
	>12 months	598	54.94	7.98	
Proteins (g/100 mL)	<12 months	3042	1.19	0.26	0.375
	>12 months	598	1.20	0.15	
Fat (g/100 mL)	<12 months	3042	2.47	0.81	0.008
	>12 months	598	2.37	0.85	
Lactose (g/100 mL)	<12 months	3042	7.44	12.31	0.666
	>12 months	598	7.23	0.40	

CONCLUSIONS

There have been no significant differences between the two study groups in terms of energy, protein and, lactose. The fat content of DHM older than 12 months is significantly lower. Despite being a significant difference, it should be noted that it only represents a decrease of 4.04%. We also highlight that there is no significant difference in the amount of protein, whose concentration, as we said previously, is key in the nutrition of very premature infants. With these results, we, therefore, consider that increasing the time limit for donating mature DHM beyond 12 months is appropriate for maintaining adequate nutritional standards.It is advisable to expand the study to take into account the influence of other factors such as gestational age at delivery and the period of lactation.

COD. P 55

COMPARATIVE ANALYSIS OF THE NUTRITIONAL VALUE AND MICROBIOLOGICAL EFFICIENCY OF THE PASTEURIZATION SYSTEM WITH WATER VERSUS THE DRY PASTEURIZATION OF DONATED HUMAN MILK

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INTRODUCTION

Donated human milk (DHM) is pasteurized to prevent the possible transmission of pathogens. The reference technique used to pasteurize human milk is the Holder method (heat treatment at a low temperature for a long time, 62.5°C for 30 minutes). Most banks in the world use this technique, as recommended by most international guidelines.The drawback of current pasteurization processes is the loss of some immunological and nutritional components. Pasteurization systems can use water (the most common method) or hot air, dry pasteurization.

AIM

To assess the effect that the two pasteurization systems (water/dry) used in our bank had on the nutritional value of the DHM and the results of the microbiological controls.

MATERIAL AND METHODS

We retrospectively analyzed and compared the nutritional value (fat, protein, lactose) and the pre-and post-pasteurization microbiological results of batches pasteurized in our bank, randomly with the STERIFEED pasteurizer that uses water and the BELDICO PA45 pasteurizer, pasteurization dry, during the period from February 2019 to March 2023. The batches were of different volumes, mainly 120 ml and always from one mother per batch, in both pasteurizers.Nutritional analysis is performed on a sample from each batch with FOSS MilkoScan Mars and pre-pasteurization and post-pasteurization microbiological cultures. The data is obtained from the GALA computer application.The statistical analysis of the data obtained was carried out using the Student's t-test for the quantitative variables and employing the 2 test, using the SPSS program, p<0.05 was considered significant.

RESULTS

The results can be seen in the attached tables.

Table 1. Mean difference in the continuous variables studied.

		N	Media	p
FAT (gr)	Beldico	1047	2.5213	0,000
	Sterifeed	3356	2.4055	
PROTEINS (gr)	Beldico	1047	1.2139	0,013
	Sterifeed	3356	1.2342	
LACTOSE (gr)	Beldico	1047	7.2706	0,000
	Sterifeed	3356	7.1932	
ENERGY (Kcal)	Beldico	1047	56.6300	0,000
	Sterifeed	3356	55.3176	

Table 2. Comparison of microbiological findings according to type of pasteurizer.

	Beldico	Sterifeed	TOTAL	P
Non eliminated batches	824 (83.74%)	2706 (81.95%)	3530	0.196
Batches with a pre-pasteurization positive result	160 (21.16%)	596 (18.05%)	756	
Non eliminated batches	824 (89.96%)	2706 (89.31%)	3530	0.575
Batches with a post-pasteurization positive result	92 (10.04%)	324 (10.69%)	416	

CONCLUSIONS

The few differences found in the means of nutritional value (fat, protein, lactose and total energy) between the batches of pasteurized DHM, using the pasteurization system with water or dry pasteurization, have been significant in all the parameters analyzed. However, in the positive microbiological cultures, both pre and post pasteurization, in the two pasteurization systems, the difference is not significant.

COD. P 56

PUNTUAL DONATION AND COLOSTRUM

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INTRODUCTION

The human milk (HM) is the best feed that a newborn can get, whose composition it's changing over time, adapting to the nutricional and immunological requirements according to the lactation period. A type of HM is the colostrum generated during the pregnancy that allows satisfy the needs os the newborn and it's characterised for his hight calorie intake, growth factors, IgA secretora, lymphocytes and macrophages that they prevent microorganisms to penetrate the intestinal tract, what it would be a risk to the baby's health.

Despite the benefits of the colostrum, the most of the HM received in our milk's bank is mature. Like that, with the objective of increase the reserves of colostrum and because it's only present the first 7 days after the birth, we question ourselves the introduction of a improvement program in the bank, that allows to increase the quantity of colostrum donated, from the maternity plant.

MATERIAL AND METHODS

It was created a group of 2 coordinated midwifes experts in HM, with competences in maternity's bank and plant to promote, protect and support the mothers who have decided to breastfeed. Both midwifes rotate every week, alternately, through the bank's consultation and the maternity plants.

Inside the bank's improvement program, it was elaborated a coordination protocol with a circuit, of new implementation, that is established as detailed below:

The recruitment of the point colostrum donor (the one that is done during her stay in the maternity plant after the birth), it's carried out by the midwife who is on the plant, taking care of the process of selection the midwife in the bank, performing the questionnaires and analyses according to the milk bank's protocol. Given that, as an inclusion criterion the lactation has to be well established, so as not to interfere with the lactation establishment, it was raised the punctual donation of donated breast milk.

RESULTS

Since the implementation of the protocol on 1/02/2023, until 29/06/2023, it have been obtained an average of 3 punctual donors per month in the maternity plant. The total volume of donated colostrum is 3330 ml.

CONCLUSIONS

Historically, the colostrum has been a scarce resource in our bank and the punctual donations in the maternity plant were, generally, anecdotal in our hospital.

The designed strategy in our milk bank managed to increase the volume of donated colostrum in 3330 ml, with an average of 3 punctual donors per month during the period included in 5 months in the maternity plant.

As futures lines of work we intend to motivate all the staff involved in the care of pregnant women, mothers and children, to know the existence of the Milk Bank, to improve the recruitment circuit of punctual donors, and to increase the dissemination of the Bank among the mothers who go to the maternity.

COD. P 57

START OF THE DONATION WHEN MORE THAN A YEAR HAS PASSED SINCE THE BIRTH… DO WE ACCEPT THE DONOR?

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INTRODUCTION:
According to the protocol of our milk bank, one of the requirements that the donor must comply it's that less than a year has passed since the birth and the start of the donation. This requirement it's based on the alleged loss of the value nutritional of human milk (HM) from that period. However, we received many women that wish to be donors after twelve months, asking us if that discarding criterion is justified.

MATERIAL AND METHODS:
In the milk bank, nutricional analysis of all HM batches is routinely carried out. This analysis quantifies proteins, lactose, fats and energy. A descriptive retrospective study was carried out based on the results of the batched of mature milk processed between April 2021 and May 2023. Milk was classified according to the date of delivery as mature 14 days-6 months (1st group), mature 6-12 months (2nd group) and mature more than 12 months (3rd group). There were 2.030 batches analysed (1051 from the fist group, 548 from the second group and 213 from the third). The arithmetic average of each nutricional value in each group was performed, and the results were compared using… STATISTICAL

RESULTS:
A) Mature milk 14 days-6 months: proteins 1,26±0,004 g/100 ml, fat 2,67±0,02 g/100 ml, lactose 7,28±0,01 g/100 ml, energy 58,30±0,20 Kcal/100 ml.
B) Mature milk 6-12 months: proteins 1,17±0,11 g/100 ml, fat 2,48±0,03 g/100 ml, lactose 7,39±0,01 g/100 ml, energy 56,63±0,26 Kcal/100 ml.
C) Mature milk more than 12 months: proteins 1,37±0,02 g/100 ml, fat 2,7±0,05 g/100 ml, lactose 7,53±0,04 g/100 ml, energy 59,54±0,54 Kcal/100 ml.
All the values analysed in mature milk of more than 1 year are higher than the values of the other two groups.

CONCLUSIONS:
Based on the nutritional values observed, the criterion of rejection of the start of donation is not justified depending of the date of the birth, since mature milk of more than one year contains a hight nutritional content. Therefore, the protocol of our milk bank has been modified and we accept donors of more than twelve months.
However, we believe it is necessary for the potential donor to contact the milk bank as soon as possible, to optimise the donation time and have other types of milk in addiction to mature milk.

COD. P 58

ARE THERE NUTRITIONAL CHANGES IN DONATED HUMAN RAW MILK DURING THE DIFFERENT PROCESSES CARRIED OUT IN THE MILK BANK OF THE MURCIA REGION?

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Introduction:
In Human milk banks is important to maintain the nutritional values of human raw milk during all process but at the same time maintain microbiological quality standards in order to preserve the safety of donated milk received by neonates. Feezing, thawing and pasteurization processes must follow standardized protocols to prevent the loss of nutrients

Aim:
The objective of this work is to study whether nutritional changes in breast milk processed according to our freezing, thawing and pasteurization protocols with respect to the initial values of raw milk received at the Milk Bank of the Region of Murcia.

Material and Methods:
The nutritional values are quantified using the FOSS MilkoScanTM MARS equipment, which will measure the parameters of fat, protein, lactose and non-fat solids (SNF).These parameters are examined for 118 batches of human breast milk, for which a 4 ml sample is taken from the following points in the process: thawed raw milk, pasteurized milk, thawed pasteurized milk

Results:
Thawed raw human Milk: % FAT 2,9±0.7; %PROTEINS 1,2±0.1; %LACTOSE 7,2±0.1; % SNF: 8,7±0.2
Pasteurized human Milk: % FAT 2,8±0.7; %PROTEINS 1,2±0.1; %LACTOSE 7,3±0.1; % SNF: 8,7±0.2
Thawed Pasteurized human Milk: % FAT 2,7±0.7; %PROTEINS 1,2±0.1; %LACTOSE 7,3±0.1; % SNF: 8,7±0.2 Fat is the most affected parameter, although no significant differences are observed. Resume: We observed that there are no significant changes in the nutritional values when process the Human milk according to our protocols.

COD. P 59

START OF THE DONATION WHEN MORE THAN A YEAR HAS PASSED SINCE THE BIRTH… DO WE ACCEPT THE DONOR?

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INTRODUCTION:
According to the protocol of our Human milk bank, one of the requirements that the donor must comply it's that less than a year has passed since the birth and the start of the donation. This requirement it's based on the alleged loss of the nutritional value of human milk (HM) from that period. However, we received many women that wish to be donors after twelve months, asking us if that discarding criterion is justified.

MATERIAL AND METHODS:
In the human milk bank, nutricional analysis of all HM batches is routinely carried out. This analysis quantifies proteins, lactose, fats and energy. A descriptive retrospective study was carried out based on the results of the batched of mature milk processed between April 2021 and May 2023. Milk was classified according to the date of delivery as mature 14 days-6 months (1st group), mature 6-12 months (2nd group) and mature more than 12 months (3rd group). There were 2.030 batches analysed (1046 from the first group, 549 from the second group and 230 from the third). The arithmetic average of each nutricional value in each group was performed, and the results were compared between the three groups.

RESULTS:
A) Mature milk 14 days-6 months: proteins 1,26±0,15 g/100 ml, fat 2,67±0,67 g/100 ml, lactose 7,28±0,32 g/100 ml, energy 58,30±6,4 Kcal/100 ml.
B) Mature milk 6-12 months: proteins 1,17±0,13 g/100 ml, fat 2,48±0,68 g/100 ml, lactose 7,39±0,64 g/100 ml, energy 56,63±8,14 Kcal/100 ml.
C) Mature milk more than 12 months: proteins 1,37±0,25 g/100 ml, fat 2,75±0,80 g/100 ml, lactose 7,53±0,76 g/100 ml, energy 60,5±9,86 Kcal/100 ml.
All the values analysed in mature milk of more than 1 year are higher than the values of the other two groups. Statistically significant differences were found between the three milk groups in all the variables studied.

CONCLUSIONS:
Based on the nutritional values observed, the criterion of rejection of the start of donation is not justified depending of the date of the birth, since mature milk of more than one year contains a hight nutritional content. Therefore, the protocol of our human milk bank has been modified and we accept donors of more than twelve months.However, we believe it is necessary for the potential donor to contact with the human milk bank as soon as possible, to optimise the donation time and have other types of milk in addiction to mature milk.

NOTE: this abstract is a review from the first one (sent it the last friday 14/07/23) with code: 344211951

COD. P 60

BISPHENOL A AND S IN NEWBORNS: THE USE OF PLASTIC MATERIALS FOR NEONATAL CARE

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Introduction: The use of plastic materials is nowadays widely spread both in the production of medical devices. Pregnancy and the neonatal period are age groups most susceptible to developing pathologies induced by environmental exposures. In recent years, the scientific community's attention has focused on certain molecules present in plastic materials that can interfere with the body's physiological functions, such as Bisphenols (BP). Bisphenol A (BPA) has been studied for its oxidative, genotoxic, and endocrine-disrupting properties. The European Union's ban on BPA in plastic materials intended for the food industry in 2015 prompted manufacturing companies to seek new molecules as substitutes, leading to the consideration of Bisphenol S (BPS) and other forms of Bisphenols as potential replacements. However, recently, it has been demonstrated that BPS possesses genotoxic characteristics and biological activity. Our study evaluated exposure to BP during pregnancy and the neonatal period.

Materials and Methods: Consecutively, newborns born to mothers with full-term pregnancies, physiological pregnancies, and no pharmacological treatments during gestation were enrolled. For each mother-neonate dyad in the study, one urine sample from the mother and one from the neonate were collected, along with one sample of colostrum. The mothers also completed a questionnaire on environmental exposure to BP (PRAMS). Finally, data on the clinical course during the neonate's hospital stay were collected. The collected samples were analyzed using Mass Spectrometry (MS) and High-Performance Liquid Chromatography (HPLC-MS) to determine the concentrations of free and total BPA and BPS (free + conjugated) respectively.

Results: A total of 268 cases (134 mothers, 134 neonates) were enrolled. During the hospital stay, 31.3% of the neonates received pacifiers, and 28.4% received oral glucose administration through bottles or single-use vials as a pain relief measure during diagnostic procedures. The study revealed a positive correlation between the use of pacifiers and the levels of free BPS ($p=0.03$) and total BPS ($p=0.04$) in the neonates' urine. A significant correlation was also found between oral glucose administration and the concentration of free BPA ($p=0.035$). Other positive correlations were observed between the administration of drugs to the mother during delivery and the levels of total BPA ($p=0.04$), total BPS ($p=0.04$), and free BPS ($p=0.05$), as well as between postpartum neonatal blood glucose measurements and the concentrations of total BPA ($p=0.001$) and free BPA ($p=0.003$).

Conclusions: European regulation focuses solely on plastics classified as food-related, and specifically on BPA, effectively excluding all medical devices such as infusion containers, syringes, etc. which can be a significant source of BP. BPS has replaced BPA but currently lacks specific regulations for its use in the production of plastic materials intended for hospital settings. This category includes also single-use bottles and nipple solid-lid used for administering human milk. Some studies have shown that BP concentrations increase with increased contact time between the material and plastic, as well as with heating and cooling processes, as seen in routine procedures performed in milk banks for pasteurization, storage of donated human milk, and subsequent patient administration.

COD. P 61

DIETARY PATTERNS OF MOTHERS OF PRETERM INFANTS AND ITS RELATIONSHIP WITH LEVELS OF PERSISTENT ORGANIC POLLUTANTS IN THEIR MILK DURING THE FIRST MONTH POSTPARTUM

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Nutritional management of infants during the first months postpartum is critical to ensure the adequate growth and development, but even more relevant for those born preterm. Previous studies have shown that maternal diet plays a role on human milk composition, especially regarding fatty acids and some vitamins. Nevertheless, little is known about the relationships between food consumption patterns of mothers and the composition of breast milk on persistent organic pollutants (POP), widespread toxicants whose source is maternal diet and environment.The main objective of this study was to characterize the dietary pattern of French mothers of preterm infant from the LACTACOL cohort and explore the associations with the levels of POPs in their milk. In this study, 103 mothers of preterm infants (28-34 amenorrhea weeks) were invited to fulfill a 125-item validated food frequency questionnaire during the first weeks after hospitalization (5.8±3.7 weeks). A 24-h sample of mother's milk was collected within the third of lactation, and analyzed for a comprehensive panel of 46 POPs by liquid and gas chromatography coupled to mass spectrometry. Dietary patterns were characterized using statistical data analysis methods (e.g. Principal Components Analysis and clustering). The association between food intake characteristics and POPs content of human milk was explored using univariate and multivariate methods. The dietary pattern analysis revealed four main food consumption patterns driven by an higher consumption of red meat, potatoes and cruciferous vegetables (Pattern 1), snack-type foods (Pattern 2), fruits (Pattern 3) and blue fish and bread (Pattern 4). POPs content was mainly associated with patterns 1 and 4. Mothers identified in the first pattern exhibited the largest mean levels of dioxins. Mothers with highest consumption of blue fish (Pattern 4) showed the highest mean levels of toxicants octachlorodibenzofuran and the widespread brominated diphenyl ether 209. To the contrary, mothers from the "snacker" pattern 2 presented the lowest mean levels of several polychlorinated biphenyls. To sum up, this study supports the fact that food consumption habits may be associated with the chemical contamination of human breast milk. These preliminary findings must be confirmed in a larger population and further research will be required to better understand if these chemical contaminants adversely affect the development of sensitive populations such as preterm infants.

COD. P 62

MICROBIOLOGICAL VALIDATION OF A HTST PASTEURIZER AT HM BANK ENVIRONMENT

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A new HTST pasteurizer for HM was developed as a prototype few years ago (Giribaldi et al., 2016, Cavallarin et. al, 2017). The system is now complete, and it was recently validated at the HM bank of Regina Margherita Children Hospital, Torino, Italy. A challenge test with pathogenic microorganisms was performed in order to validate the eradication of pathogens from milk.The following target microorganisms (ATCC certified strains) for the validation process were chosen: Staphylococcus aureus and Salmonella enterica. The target reduction was 6 D for each microorganism, following the standard protocol for pasteurized bovine milk. The experimental workflow was performed in triplicate. The experimental units were made up by frozen and thawed donor human milk, with 1000 ml milk pools from 2-3 donors, that were recruited following the Italian Donor Human Milk Banks guidelines.The starting milk pool was pasteurized using the Lo.V.Milk system (72.5°C for 15 sec, according to the manufacturer) to be used as inoculum substrate. The target microorganisms were inoculated separately at 1 x 10 6 cfu/ml; the milk was then rapidly pasteurized following the manufacturer's instructions. The system was cleaned and sanitized after each pasteurization cycle, by using the special washing program, and the absence of contamination was verified in the flushing water. The pasteurized milk was stored at 2-4°C in refrigerator, and analysed after 24 hours, in order to limit the number of viable but non-culturable cells, as a result of thermal shock. The analytical assessments were conducted following traditional microbiological methodology, using the ISO procedures detailed in the Regulation 2073/2005. Each analytical procedure was conducted in triplicate.
No pathogen or bacterial growth was detected after HTST pasteurization with the new instrument.

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COD. P 63

BREASTFEEDING WOMEN'S SATISFACTION WITH THE QUALITY OF MIDWIFERY CARE

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Introduction: Continuing competition in every field is also affecting the healthcare services. Official certifications of healthcare services reassure that healthcare professionals provide high quality services. The need for increased quality in providing healthcare services in a maternity hospital is expressed through women's expectations. Breastfeeding women's satisfaction remains an important indicator of the quality of midwifery care in a Baby Friendly Hospital.

Aim: To estimate breastfeeding women's satisfaction with the quality of midwifery care in a certified, since 2011, Baby Friendly Hospital in Athens, Greece. The hospitals' Human Milk Bank is also ISO certified due to ISO 9001:2015 since March 2023.

Methods: A descriptive study conducted in Elena Venizelou Maternity Hospital, from 1st of June to 20th of July 2023, at hospital discharge from breastfeeding women who were willing to fill in a midwifery care quality questionnaire with a total of 5 questions specially designed due to the ISO 9001:2015 certification principles of the Human Milk Bank of the hospital. The questions specifically designed about the evaluation of services that support breastfeeding included immediate response to every call for help, appraisal of adequate support in the promotion of exclusive breastfeeding, uniformity in the behavior and knowledge of midwives concerning breastfeeding, the level of breastfeeding support from the medical staff and ensuring a satisfactory environment suitable for the promotion of exclusive breastfeeding. Results:61 women exclusively breastfeeding their infants at discharge completed the questionnaire. Exclusive breastfeeding rates in June 2023 and July 2023 were 80.5% and 77.9% respectively. 52.5% rated the immediate response to the call for help as very good and 36.1% as rather good 9.8% characterized the immediate response as neither good nor bad while 1.6% as poor. The provision of appropriate, in techniques, support was also evaluated by 52.5% as very good, by 31.1% as rather good and by 14.8% as neither good nor bad (1.6% as poor). Regarding the existence of uniformity in midwives' views on breastfeeding, 60.7% characterized it as very good and 23% as rather good (14.8% as neither good nor bad and 1.6% as poor). The evaluations of the women for the promotion of breastfeeding by the medical staff were characterized as very good by 62.3%, rather good by 27.9% and neither good nor bad by 8.2% (as poor by 1.6%). Finally, regarding the suitability of the environment for the promotion of breastfeeding, it was evaluated as very good by 54.1%, as rather good by 37.7%, neither good nor bad by 6.6% and poor by 1.6%.

Conclusions: The majority of women were highly satisfied with our services. There was one (1) woman who, despite exclusively breastfeeding her newborn, described our services as poor. All women were treated the same concerning breastfeeding support.

COD. P 64

RETROSPECTIVE STUDY OF THE QUALITY OF TRANSPORT CARRIED OUT IN THE MILK BANK OF THE REGION OF MURCIA

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INTRODUCTION

One of the critical points during the donation is that the raw milk, once frozen, must be kept frozen until the pasteurization process is carried out, otherwise alterations in the nutritional value of the frozen donated milk could occur. Control of the cold chain should be maintained from the delivery by donors of raw milk at home, as well as during transport until its reception at the Milk Bank.

The main objective of this study is to evaluate the nutritional changes of raw human milk when it is thawed and frozen. Consequently, the second objective is to examine whether the transport protocol used in the Milk Bank of the Region of Murcia is adequate to maintain the quality criteria of raw milk.

MATERIAL AND METHODS

For the main objective, the nutritional values were quantified using the FOSS MilkoScanTM MARS equipment. 118 batches of processed raw milk were included in our Human Milk Bank and the values (% Fat, % Protein, % Lactose, % Non-Fat Solids -NFS-) were studied in thawed raw human milk and thawed raw milk with the Frezze-Thaw cycle.

For the second objective (efficiency of our transport protocol), it should be said that the donors freeze the milk at home and it is transported frozen to the milk bank in Murcia. The differences between the initial transport temperature at the donor's home and the temperature at the arrival of the frozen raw milk at the milk bank were studied.

RESULTS

• Thawed raw human milk: % FAT 2.9±0.7; %PROTEINS 1.2±0.1; % LACTOSE 7.2 ± 0.1; % SNF: 8.7±0.2
• Thawed refrozen raw human milk: % FAT 2.7±0.7*; %PROTEINS 1.2±0.1; % LACTOSE 7.2 ± 0.3; % SNF: 8.7±0.3 Changes in milk fat are nutritionally significant during refreezing of raw milk.
• The average initial temperature -12.98ºC +/- 4.79 and the average temperature at which it reaches the milk bank is -9.95ºC +/- 4.79. The average temperature loss during transport is 3.2ºC.

CONCLUSIONS

During transportation we have a small loss of temperature. It is also observed that the initial temperature is usually constant for each donor. It is important to avoid refreezing thawed raw human milk, so we must be careful in those donors in whom the initial temperature is observed to be higher than -8ºC, establishing by protocol that the milk that arrives at the bank with a temperature higher than -4ºC will be thawed and pasteurized the following day.

COD. P 65

BREASTFEEDING AND WAR IN UKRAINE: NEW REALITY AND NEW CHALLENGES

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Introduction. 2022, the full-scale invasion of the Russian Federation on the territory of Ukraine brought new challenges to the healthcare system. Russian terrorists violate the Geneva Convention and target healthcare facilities, which hinders peoples right to access necessary medical care. This is the destruction of the medical infrastructure, the impossibility of complying with the norms of prevention and treatment, the lack of medical staff and the disruption of logistical connections. WHO has confirmed 1,100 attacks on health care reported after February, 24. Children are born in basements and bomb shelters, without access to proper medical care. Discussion. According to the UN Population Fund, at the beginning of the full-scale invasion of the Russian Federation, about 265.000 women in Ukraine were expecting a child. Most of those had to give birth at home, or in maternity hospitals that were moved to bomb shelters or basements. This lead to the increasing frequency of premature birth (from 6,4% in 2021 to 7,6% in 2022). In these conditions, the best and safest way to feed babies is breast feeding (BF), and in the lack of it - feeding with donor's breast milk. Today, there are 3 donor breast milk banks (DBMB) operating in Ukraine. The first DBMB in Ukraine appeared in Kyiv in 2019. In 2022, during the war, 2 DMMB were opened in Lviv Oblast. Staff training took place under the assistance of the Association of DBMB of Poland.) As of January 1, 2023, 417 health care facilities have the status of "Baby-Friendly Hospital» (BFH). Amount of health care institutions, certified according to the status of BFH among those that provide assistance to mothers and children and should be certified is 29.5% (29.4% in 2021). The 93.3% of all maternity hospitals are certified, 100% perinatal centers of level II and 78.9% level III; regional children's hospitals - 66.7%; city children's hospitals - 61.4% are certified by BFH as well. The level of exclusively BF up to 6 months at certified institutions in 2022 was 66.1% (75.6% in 2021). In all healthcare institutions this indicator in 2021 is lower, 56.06%. One of the biggest challenges for the maternity and childhood service after the beginning the war are the uncontrolled supply of milk substitutes and their distribution to mothers without understanding their ability to breastfeed. The position on the protection of maternal and child nutrition is reflected in the “Joint Statement on protection of mother and child nutrition in the context of the conflict in Ukraine and the crisis refugees" from March 8, 2022 UNICEF, Global Cluster on Nutrition. Conclusions and recommendations: Newborns and young children are one of the most vulnerable categories during wartime in Ukraine. Nutritional support is the important area of feeding young children and BF is the highest priority. Controlling the supply of natural milk substitutes and complying with the provisions of the International Code is an important challenge in protecting children's health.The booklet: https://bit.ly/GV_0-24. At least two generations of Ukrainians will feel the damage of the war to one degree or another.

COD. P 66

TREATMENT OF CHYLE ACCUMULATION PATHOLOGY IN THE NEWBORN WITH SKIMMED BREAST MILK

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INTRODUCTION: Pathology due to chyle accumulation in the neonatal period is rare and potentially serious condition, frequently associated with malnutrition and immunodeficiency due to loss of proteins and immunoglobulins. Among the aetiologies, chylothorax is the most frequent, with an incidence of 1:15,000 births and a postoperative risk of 0.2–2% in pediatric surgery, and chylous ascites is very rare with an incidence of 1:20,464 admissions. Conservative treatment includes dietary management with a long-chain triglyceride- restricted diet to prevent chyle accumulation. Processing of breast milk by centrifugation allows a significant reduction of the fat content while preserving the protein and lactose content.

OBJECTIVES:
To describe the characteristics of patients with pathology due to chyle accumulation who received skimmed LM. To analyze the composition of milk before and after skimming processing.

MATERIAL AND METHODS
Descriptive study of patients with pathology due to chyle accumulation admitted to the neonatology or pediatric intensive care unit treated with skimmed breast milk during the period between March 2017 and June 2023. The skimming procedure consisted of: 1. Aliquoting of the breast milk (BM) in a laminar flow hood. 2. Analyzing macronutrients with the near-infrared spectroscopy technique (Human Milk Analyzer, Miris, Sweden) pre-procedure. 3. Centrifuge BM aliquots in a refrigerated centrifuge at 2ºC at 3000 rpm, 15 minutes. 4. Post- processing analysis.

RESULTS: 14 patients received skimmed breast milk as part of their treatment, the most frequent diagnosis being congenital chylothorax, followed by post-surgical chylothorax (cardiopathies 3, 1 diaphragmatic hernia, 1 esophageal atresia) and 2 post- pleural drainage. One case presented chylous ascites in the postoperative period after gastroschisis surgery. In most cases the skimmed BM was from their own mother (11 cases) and in 3 cases they received mother's own milk and skimmed donor BM. Three patients died. The volume of LM received ranged between 960 and 11260 ml. The processing reduced the fat content to 17% and the energy content to 58%. The values obtained before and after processing were (median and SD): protein 1.35 (0.35) vs 1.3 (0.34); fat 3.5 (0.76) vs 0.6 (0.16); lactose 7.55 (0.97) vs 7.6 (0.79) Energy 72 (6.9) vs 42 (2.7). In all cases, skimmed BM was supplemented with a module of MCT, liposoluble vitamins and DHA.

CONCLUSIONS
Skimmed breast milk is an option in the conservative treatment of chyle accumulation pathology. With the technique described, a significant decrease in fat and secondarily in energy intake is obtained, preserving the protein and lactose content. In the series presented, as described in the literature, the most common aetiology is congenital chylothorax. High mortality is observed (78%). At hospital discharge, most of the patients continued to be breastfed, 91% were breastfed (55% partial and 45% exclusive) and 9% with a formula rich in MCT.

COD. P 67

HOW FAR ARE WE FROM THE GOAL OF FEEDING ALL VERY LOW BIRTH WEIGHT INFANTS WITH HUMAN MILK?

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Starting from the beneficial and sometimes salvific effects of breast milk for very low birth weight babies, in the short and long term, we evaluated whether are available data on the prevalence and duration of feeding with human milk (HM) in NICU and at discharge. We reviewed the information available on determinants and predictors of nutrition with maternal milk, and the data were insufficient and sometimes contradictory. We also wondered if it is known how much donated milk is available for this category of infants. Furthermore, we believe that they are all elements that should be monitored globally. Only careful and systematic monitoring can result in an improvement of the feeding practice in NICU and an effective promotion of breastfeeding. Since the maximum protection induced by breast milk is achieved when vulnerable infants receive high doses and long exposure to HM, the indicators to know should be: the extent of nutrition with HM during hospitalization, at discharge and in the following months, the timing of the start of enteral feeding, the achievement of Full Enteral Feeding and the amount of HM taken. The pandemic has taught us that these events strongly impact nutrition with HM and all states should already have measures in place to combat this negative effect. The pandemic has also made us aware of the importance of data. Without proper measurement of data there can be no verifiable change in practice. Even with little data currently available, the promotion measures of many governments are resulting in better performance of feeding VLBWs with HM, although not yet sufficient. Common parameters should be identified, indicators that should serve to guide measures to contain the risk of not feeding the most fragile infants with HM. The ultimate goal is to understand how far away is the objective of giving all premature babies the health opportunity represented by human milk.

What is Known:

1. The intake of maternal milk in preterm infants mitigate the effects of premature birth by preventing neonatal morbidities such as NEC, infections, ROP, BPD.
2. This aspect of assistance in NICU is crucial.
3. The impact is stronger if the volume of HM consumed is greater and the exposure to HM is longer.
4. The effects of the use of HM on the health of this category of newborns produce significant cost savings in the short and long term. What is New:

1. Data on the volumes and times of exposure of very low birth weight infants to HM are few and occasional.
2. Attempts to understand the factors that act as facilitators or obstacles to feeding babies with human milk are insufficient.
3. Globally, the signs of an increase over time in the rates of feeding with HM and breastfeeding are there, but there is still ample room for improvement.
4. There is a discrepancy between the well-known methods of promotion and their application.
5. The absence of systematic monitoring of this element of the care of preterm babies may invalidate the result.

COD. P 68

DOES THE DURATION OF LACTATION CHANGE THE MACRONUTRIENTS OF DONATED HUMAN MILK?

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INTRODUCTION

The optimal nutrition for neonates is human milk. The best substitute for a mother'smilk, according to WHO, is donated human milk, which is securely provided through human milk banks, especially for preterm neonates. Human milk banks adopt strict screening procedures to exclude donors who are more than six months in lactation.
This study aims to investigate the nutritional value of donated human milk's macronutrient profile and detect how preterm birth and nursing length affect composition of human milk.

METHODS

We conducted an observational study from June 2021 to June 2023. We utilized mid-infrared transmission spectroscopy (MIRIS) to analyse breast milk samples donated to our human milk bank. This helped us assess their nutritional content. Samples were categorized into 4 groups according to characteristics of donors: 1st group consisted of breast milk from women with full- term babies who donated milk pumped up from the first month to the third month, 2nd group consisted of breast milk pumped up from 4th month to 6th month lactation period, 3rd group consisted of breast milk from mothers with preterm babies who donated milk pumped up from first month to third month, 4th group consisted of breast milk from mothers of premature babies and donated from 4th to 6th month lactation period. Statistical analysis (jamovi 2.3.21) was accomplished to clarify the impact of breastfeeding time and preterm delivery on human milk's nutritional status. One-way ANOVA and Kruskal-Walis tests were used and 0.05 was chosen as cut-off value for statistical significance.

RESULTS

86 samples, belonging to 74 women donors were analysed. Mean protein content in groups 1, 2, 3 and 4 was 1.09, 0.88, 1.3 and 1.24 grams/dl respectively. Fat content was 4.06, 2.57, 3.9 and 3.24 grams/dl and lactose content was 8.33, 8.61, 8.63 and 8.7 grams/dl in all 4 groups respectively. The mean energy supply was 77.03, 63.1, 76.33 and 71.8 Kcal/dl respectively. We found a higher protein content ($p < 0.05$) in samples from mothers with a breastfeeding time of less than 3 months (group 1 + 3) compared to samples of mothers with prolonged breastfeeding (group 2 + 4), higher fat content ($p < 0.05$), higher energy supply ($p < 0.05$), but no differences in lactose were found. When comparing groups 1 and 3 separately and 2 and 4 separately, we have observed higher protein, ($p <0.05$), and no differences in fat and energy content in samples of mothers with a preterm delivery.

CONCLUSIONS

Undergoing breastfeeding for prolonged period should be a matter of concern to be appropriate for preterm babies. Protein content is significantly lower during the second group period (<1 gr/dl), not enough to accomplish nutritional demands of preterm receivers without targeted fortification. There are more differences in macronutrient status and energy. Mothers who delivered preterm infants had donated milk with better nutritional quality, higher protein, fat and energy content during first months after delivery. We should take this into account to optimize allocation of milk to neonatal recipients according to their nutritional needs.

COD. P 69

IS FRUIT AND VEGETABLE INTAKE LEVEL A DETERMINANT FOR BREASTMILK MACRONUTRIENT COMPOSITION? A CONTRIBUTION FROM THE DASTATUZ TRIAL

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Some cohort studies and metanalysis have described a relation between maternal diet and milk composition. A few of them have focused on different dietary patterns and their possible impact on composition. However, there is still a great variability on the results and it remains as a subject to address in order to achieve a deeper understanding of the factors inducing composition differences and its possible impact on future developmental or behavioural aspects.
Dastatuz is an ongoing quasi-experimental trial (NCT04262102) following mothers 'diet along the last trimester of pregnancy and breastfeeding. Milks samples were collected from some volunteer participants: 21 samples from high fruit and vegetable consumers (HFV) and 17 from participants following a standard diet (STD) regarding fruit and vegetable intake. Total content of proteins, lipids, lactose and non-fatty solids were analysed at the reference Milk Bank of the Basque Country, following standard procedures to collect, storage and analysis. Measures were performed in triplicate. Dietary recalls were asked every 2-3 weeks during the period of the study and they were analysed in terms of intake of principal food groups. Special attention was paid to fatty food and animal protein sources, considering that those are generally inversely related to the intake of fruit and vegetables.
Mothers in STD group had a significantly higher intake of total dairy and fatty foods, except for blue fish which intake was significantly greater in the HFV group. Fruit and vegetable intake was 3.42-4.20 portions a day for the former group and 5.38-6.32 portions a day for the last. Protein content in breast milk samples was greater in HFV compared to STD (1.0493±0.1141 g/dL and 0.9854±0.1150 g/dL, respectively). No statistical significance was found for the rest of the parameters, but total lipids were 15% lower in milk samples from HFV (2.4221±1.1695 g/dL) than in STD samples. There was a high variability in lipid content among samples, and that is probably why this difference is not reflected statistically. Mean lactose content was 7.6038±0.2295 g/dL and mean non-fatty solids 7.8642±0.4098 %. These results contribute to explain the extent of the impact of mothers' diet on breastmilk composition and suggest that further insight on macronutrients, especially lipids and proteins could reveal specific fingerprints related to certain dietary patterns.

COD. P 70

FATTY ACID PROFILE AND VITAMINS AS AFFECTED BY MATERNAL FRUIT AND VEGETABLE INTAKE

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Dietary patterns are gaining importance as a factor with health implications. They offer a more realistic approach to diet and its impact than studying single nutrients, compounds or foodstuffs. The Dastatuz trial allocated participants to a high fruit and vegetables intake group(HFV) or to a standard intake group (STD), according to their own likes and habits (quasi experimental approach). Possible changes in milk composition due to fruit and vegetable intake might have an impact on child development, as described in the literature. It might also change the sensory profile of the milk influencing early tasting experiences of the child and possibly conditioning his/her future behavior towards certain foods. Assessing this is the principal aim of the ongoing Dastatuz trial. Preliminary results of milk composition revealed a tendency for higher lipid concentration in the milk from STD group and statistically higher protein content in HFV group. These results suggested that a detailed analysis of these nutrients could be of interest. The main objective of this contribution is to analyze the fatty acid (FA) profile of breast milk samples collected within Dastatuz trial from HFV or STD group. Taking into account results on protein content, some water-soluble vitamins (mainly B type) were also quantified and compared among groups, as those use to be related to dietary protein sources.
Milk samples for the analysis of FA and vitamins were selected form extreme dietary patterns, n=15 for HFV group and n=10 for STD group. Participants were asked to follow the standard procedure of the Milk Bank of Euskadi for milk collection and samples were maintained at -80ºC until analysis, which were performed in triplicate. For FA quantification, milk fat was isolated by centrifugation and, after derivatization, samples were studied by gas chromatography, following a method previously described. Water-soluble vitamins were analyzed by HPLC.
Milk from mothers in the HFV group had significantly higher total saturated fatty acids (186.56± 41.02 compared to 169.53± 47.11mg/g fat), monounsaturated FA (276.99± 83.31 compared to 216.95± 68.49mg/g fat) and polyunsaturated FA or PUFAS, as well (92.07± 25.79 compared to 88.49± 31.22 mg/g fat). Long chain PUFAs n6 and n3 were also statistically higher values in HFV group. Regarding n-6/n-3 ratio, it was significantly higher in STD group (10.76±3.57 vs 9.08 ±2.18 mg/g fat), which is probably due to the higher intake of fatty fish described for participants allocated to HFV. Regarding vitamins, STD milk samples had higher values of thiamine and pyridoxine, B1 and B6, respectively. This agreed with the greater animal protein intake described for this group. In spite of the moderate samples size, clear differences could be described for FA profile and some water-soluble vitamins related to fruit and vegetable intake. Results are promising towards a possible fingerprint related to dietary habits of breastfeeding mothers.

COD. P 71

MAINTAINING EQUITY AND QUALITY WHILE SETTING UP 25 HUMAN MILK BANKS : THE INDIAN EXPERIENCE

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Introduction:
We have performed an observational study of Maintaining quality in setting up 25 Human milk Banks across India and thereby ensuring equity in the quality of the DHM supply. India is a diverse country with different institutions working on different thought processes. This leads to a lot of variation in the processing of the DHM. In order to ensure equity and quality of DHM across India, standardization of processes is necessary. Furthermore having regular auditing to check if the standard processes are being followed should be made mandatory.

Methodology:
We have evaluated using 5 main parameters:

1. Type of Setup: whether private or Government or independent and its impact on the functionality of the milk bank.
2. Timing of the training intervention: pre-establishment, during establishment or post establishment and its subsequent impact on the functionality of the milk bank
3. Common problems seen during operations
4. Advantage of implementing Standard Operating Procedures
5. Sustainable functionality of the milk bank after 1 year of successful running. Conclusion:
   We have observed that continuous training, timing of the training, training in problem solving, Standard Operating Procedures make a positive impact in the long term and sustainable and safe functioning of the Human Milk Banks in all the above-mentioned setups.

COD. P 72

ACCUMULATION OF MOTHER'S OWN MILK IN EARLY LIFE AND ITS ASSOCIATION WITH MORBIDITIES AND NEURODEVELOPMENT OUTCOMES IN A SINGLE CENTER OF VERY PRETERM INFANTS

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Very preterm infants (VPIs) born before 30 weeks of gestation often experience higher morbidity rates and require multidisciplinary care. When compared to preterm formula, human milk offers protection to VPIs by reducing morbidity rates and improving neurodevelopmental outcomes. However, not all mothers of VPIs can provide enough of their own milk for their infants and may need to rely on donor human milk (DHM) instead. The process of pasteurization, involving thermal treatment at 62.5 °C for 30 minutes, is applied to donor human milk (DHM). Despite its benefits, pasteurization leads to the loss of milk microbiota and a reduction in certain bioactive elements while preserving the overall nutritional components of DHM. For the purposes of this study, notably, very preterm infants (VPIs) who received predominantly mother's own milk (MOM) during the first month demonstrated improved growth outcomes upon discharge from the neonatal intensive care unit. Methods: This retrospective cohort study was conducted at the National Cheng Kung University Hospital in Tainan, Taiwan, consisting of a 20-bed facility. The eligible study population included very preterm infants (gestational age less than 30 weeks) admitted within three days of birth from January 2015 to October 2020. Longitudinal K-mean (kml) clustering was used to cluster the daily intake accumulation of MOM amounts in 3 trajectories. Primary outcomes were the incidence of retinopathy of prematurity (ROP) and bronchopulmonary dysplasia (BPD) at term equivalent age. The secondary outcome was neurodevelopmental impairment at 18-24 months of corrected age. Multivariable logistic regression analysis was performed to evaluate the crude effects of the potential independent variables on the outcome. Results: A total of 308 very preterm infants were enrolled. The kml clustering analysis was used to identify three distinct MOM accumulation progression patterns: MOM-dependent, late-MOM-dependent, and DHM-dependent, based on an accumulation of daily MOM feeding volume per kilogram for the first 28 postnatal days. In the multivariable logistic regression model, the late MOM-dependent group, compared to the DHM-dependent group, has a significantly lower odds ratio in the incidence of severe ROP (TEA) (adjusted odd ratio:0.23, p=0.007) but no difference in severe BPD. Moreover, the neurodevelopmental impairment has a lower odds ratio in the late MOM-dependent group compared to the DHM group after adjusted (adjusted odd ratio:0.45, p=0.03). Conclusion: Increasing early-life mother's own milk intake may decrease the ROP rate and neurodevelopmental impairment at the corrected age of 24 months but has no effect on BPD.

COD. P 73

NEWBORNS WITH CONGENITAL HEART DISEASE RECEPTORS OF DONOR BREAST MILK

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INTRODUCTION
The main recipients of breast milk banks are premature or very low birth weight newborns. However, other patients at risk of necrotizing enterocolitis may also benefit from this resource. Among them are patients with low-output or cyanotic congenital heart disease (CHD). These newborns are also at risk of malnutrition.

OBJECTIVE
Describe the use of donor human milk in the populations of newborns with congenital heart disease
MATERIAL AND METHODSReview of the characteristics of the patients with CHD who were donor breast milk receptors in the period 2011-2023 in a third level neonatal unit and the composition of the DBM received.

RESULTS
246 patients with CHD received DHM for that reason. Mean gestational age was 38 weeks (range 32-41), and mean birthweight was 2957 (range 1520-440). Mean volumen received was 1962 liters (40-26,430).13 patients who had another indication for receiving DHM had also a CHD. The indication was GA below 32 weeks or BW below 1500g.DBM composition was very variable with mean energy (Kcal/100 ml), protein(g/100 ml), fat g/100ml) and lactose (g/100 ml) : 61.4, 1.01, 2.4 and 7,05.

CONCLUSIONS
Newborns with CHD constitute a significant population of DBM receptors. They have special nutritional needs and high risk of necrotizing enterocolitis but also malnutrition. For this reason they might need an individualized fortification different from that of preterm infants

COD. P 74

DIETARY INTAKE OF HUMAN MILK DONORS FROM ITALY, THE NETHERLANDS, AND POLAND AND ITS IMPACT ON DONOR HUMAN MILK COMPOSITION

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Donor human milk (DHM) is the best way of nutrition for preterm infants when mother's own milk is not available. Considering the results of epidemiological studies, the most important reason for providing DHM instead of breast milk substitutes is protecting infants against necrotizing enterocolitis. The nutritional value of human milk (HM) is affected by many factors, including gestational age, postpartum period, circadian cycle or maternal nutritional status and diet.Therefore, the main aim of this multicenter study was to assess and compare dietary intake of HM donors from three different European populations (Italy, The Netherlands and Poland) and its impact on DHM composition. To achieve the goal, we performed a longitudinal study (three time points were included), however for the present analysis we used only data from the first time point (between 2 and 12 weeks postpartum). We used 3-day dietary recalls and collected standardized HM samples. HM energy and macronutrients content was assessed with MIRIS Human Milk Analyzer, whereas as quantification of 9 fatty acids (FAs), 11 vitamers of vitamins B, vitamin C and 2 vitamers of vitamin D was performed using ultra-performance liquid chromatography coupled with mass spectrometry. In total, we collected data and samples from 80 HM donors (Italy n=26; Netherlands n=11; Poland n=43). Energy intake differed significantly between populations (p=0.024) and the highest value was observed in Dutch women. Regarding macronutrient intakes, significant differences were observed for total protein (p=0.046) and carbohydrate (p=0.006) consumption. Although total fat intake did not differ between donors from different countries, we observed some differences in FAs consumption - arachidonic acid (AA) (p=0.024), palmitoleic acid (p=0.001) and total intake of polyunsaturated FAs (p= 0.015). Additionally, salt and saccharose intake differed significantly (p=0.026 and p=0.006, respectively) among donors from different countries. Regarding HM composition, significant differences among donors from different countries were observed in the following macro- and micronutrients: lactose (p<0.01), vitamin B1 (p=0.01), oleic and linoleic acids (for both, p=0.024), alpha-linolenic acid (p<0.01), DHA and eicosapentaenoic acid (for both, p<0.01).We found only a few associations between HM composition and donors' diet. Regarding macronutrients, lactose content was positively associated with maternal total fat intake. Energy value of DHM was positively correlated with fat consumption (r=0.24, p=0.04) expressed in grams (r=0.27, p=0.023) as well as total percentage of energy which came from this nutrient (r=0.29, p=0.013). DHA content in HM samples was positively correlated with maternal vitamin B1 (r=0.29, p=0.014) and vitamin B6 (r=0.34, p=0.004) intake. HM concentration of nicotinic acid was negatively correlated with maternal vitamin B12 intake (r=-0.26, p=0.035).The results of our study revealed many differences in dietary intake and composition of DHM among donors from Italy, The Netherlands and Poland. Further analysis is needed to rule out whether the observed differences are related to maternal diet or to other factors.

COD. P 75

SOCIODEMOGRAPHIC PROFILE OF THE HUMAN MILK DONOR

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Introduction
The Milk Bank (MB) has the mission to ensure that all premature patients in the neonatal units of our autonomous community have access to Donated Human Milk (DHM), as long as they cannot be breastfed by their own mother.

Objectives
To understand the sociodemographic profile of donor women and identify the correlation between DHM donation and other parenting practices, as well as other types of donation or social practices, in order to better understand this phenomenon and carry out targeted promotion activities effectively.

Materials and Methods
A qualitative study was carried out through online focus groups with mothers who made donations in 2019 and 2021. In total, 17 mothers voluntarily participated, and no monetary compensation was paid in exchange for the participation. All group conversations were manually transcribed, and the discourse analysis was conducted using ATLAS.ti to identify the relevant categories. Once these categories were identified, a quantitative and retrospective approach was used to identify the sociodemographic profile of the MB donors. Information provided by other 580 donors from 2019 to 2022 was also obtained through a questionnaire.

Results
The qualitative findings revealed which were the main categories related to the motivations for becoming a donor. These were mostly linked to a specific understanding of parenting or blood donation as a structural form of community participation. Personal experiences related to DHM and being a human milk donation receiver also emerged as motivations for being a human milk donor. Quantitative results showed that out of the 580 donors, 97.4% practice demand-based breastfeeding, 72.4% practice co-sleeping, 86.4% apply the philosophy of free movement, 73.6% practice baby-led weaning, and 82.4% raise their children with unlimited displays of affection.Regarding other types of donation, 46% are blood donors, 6.6% are umbilical cord blood donors, and 4% are placenta donors.The donor profile results show that 88.3% are Spanish, and 82.8% reside in urban areas. 73.5% have a university education, and there is no representation of women with education below the compulsory secondary level. 70.5% initiate donation between the ages of 31 and 40, 66.7% have a child, and 97.2% live with a partner.

Conclusions
The donor profile is that of a Spanish woman between the ages of 31 and 40, residing in an urban area, with a university education, a baby, and living with a partner.Certain parenting practices appear to be strongly related to the decision to become a DHM donor, all of which belong to a parenting style known as "respectful parenting."Furthermore, for many women, milk donation follows blood donation, perceived by donors as a continuum.Promotion campaigns for DHM donation should integrate the universe of meanings surrounding DHM donation to develop more appropriate communication messages.

COD. P 76

POSTGRADUATE PROGRAM IN BREASTFEEDING AND HUMAN MILK DONATION

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INTRODUCTION

University training in human milk banks (HMBs) is practically non-existent, despite its relevance at the public health level. This study presents the first and only university program on breastfeeding, milk donation (MD), and HMB aimed at training professionals capable of providing appropriate support and advice to mothers at any stage of the breastfeeding time frame. The postgraduate program is structured into four training modules that address the phenomenon from a multidisciplinary perspective. Methodologically innovative teaching approaches are used, such as clinical simulation, biographical writing, real case resolution, and seminars.

OBJECTIVES

Analyze the sociodemographic information of the students. Compare the academic results and satisfaction levels.

METHODOLOGY

A retrospective descriptive study that includes: the data collected from 94 students who completed the postgraduate program from January 2020 to December 2022; the sociodemographic data obtained from the registration and enrollment process; the academic data derived from the assessment activities; the evaluation of the training program based on a satisfaction survey.

RESULTS

The first edition counted a total of 32 enrollments, 34 enrollments second edition, and 28 on the third edition. The average was 30.7 students per year. Of the total 94, 91 were female and 3 were male. Regarding the age range, 18% were 18-30 years old, 53% 31-40, 17% 41-50, 11% 51-60, 1% more than 60. In terms of nationality, 43,4% were Spanish, 13,8% from Costa Rica, 8,5% from Mexico, 7,4% from Colombia, 5,3% from Ecuador, 4,3% from Chile, 3,2% from Paraguay, 3,2% from Peru, 2,1% from Argentina, 2,1% from Guatemala, 2,1% from Honduras, 1,1% from Venezuela, 1,1% from the Dominican Republic, 1,1% from Panama, and 1,1% from Uruguay. 42,6% of the students came from the field of medicine, 32% from nursing, 6,4% from microbiology, 4,3% from biology, 2,1% from administration, 2,1% from physiotherapy, 2,1% from nutrition, 2,1% from dentistry, 2,1% from psychology, 1,1% from pedagogy, 1,1% from food engineering, 1,1% from pharmacy, and 1,1% from veterinary. 86% of the students completed the postgraduate program. 41% achieved excellent grades (9-10), 38% achieved a notable grade (7-8.9), and 7% approved with a satisfactory grade (5-6.9).Regarding the chosen topics for the final postgraduate projects, 40% related to breastfeeding as a social and cultural phenomenon, 20% related to HMBs and MD, 24% related to breastfeeding and nutrition, and 16% related to breastfeeding and health. Regarding the satisfaction surveys, 74% rated the course organization as excellent, 68% rated the provided materials very positively, 73% rated the content very well, and 71% rated their experience as satisfactory or very satisfactory.

CONCLUSIONS

There is interest among healthcare professionals, social professionals, and health sciences professionals to receive university-level training in breastfeeding and MD. The academic results and evaluations are highly satisfactory and confirm the achievement of the program's goal. The 4th edition is currently underway with 23 enrolled students, and the 5th edition's registration period is open. University- level training in breastfeeding and MD, specifically targeted at professionals, is of utmost importance for these mothers, their families, and society as a whole.

COD. P 77

COMPARISON OF NUTRITIONAL COMPOSITION OF DONOR HUMAN MILK FROM SELECTED EUROPEAN POPULATIONS

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Donor human milk (DHM) the first alternative to mother's own milk (MOM) if MOM is insufficiently available for preterm infants. The nutritional and non-nutritive contents of milk collected in human milk banks depends on many factors including individual characteristics of women donating milk. The purpose of this study was to measure the nutritional composition of DHM in selected European countries. For this study, we collected human milk samples from active donors in 3 countries: Poland, Italy and The Netherlands. Milk samples were collected from each woman between 2 and 12 weeks postpartum (we performed a longitudinal study, where three time points included, but for this analysis we used only data from first stage of the study). In Poland, 35 women participated in the study, in Italy - 26, and in the Netherlands 11. Macronutrient milk composition including total and true protein, fat, carbohydrate, dry matter, and energy contents were determined by mid-infrared transmission spectroscopy using the Human Milk Analyzer from MIRIS. Quantification of 9 fatty acids (FAs), 11 vitamins B and C and 2 vitamin D isomers was performed using ultra-performance liquid-chromatography coupled with mass- spectrometry. Among the macronutrients tested in DHM, statistically significant differences were observed only in the case of lactose ($p<0.001$). The median (IQR) for the population of donors from The Netherlands was the highest and amounted 8.5 (8.3 - 8.7) g/dL, for Polish donors 8.1 (6.2 - 8.6) g/dL, and for Italian donors 8.2 (7.8 - 8.6) g/dL. A similar pattern was seen for thiamine ($p<0.001$) where milk samples from Dutch women had the highest concentrations (25 (6 - 57 ng/ml) in Dutch samples 26 (7 - 57) ng/ml in Polish samples, and 25 (6 - 57) ng/ml in Italian samples). In the case of other vitamins, we did not obtain statistically significant differences. The most diverse components of DHM turned out to be fatty acids. Statistically significant differences were observed in the concentrations of oleic acid, linoleic acid, alpha-linolenic acid, gamma-linoleic acid, docosahexaenoic acid (DHA) and eicosapentaenoic acid (EPA). Compared to Dutch donors, lower values of several measured fatty acids were recorded in the milk of Italian and Polish donors. For DHA ($p<0.001$), the mean concentration in milk from Polish (100.68 ± 64.98 µg/ml) and from Dutch women (123.58 ± 131.34 µg/ml) was higher than from Italian women (53.31 ± 37.95µg/ml). In case of EPA ($p<0.001$) again, Italian donors had the lowest milk concentrations (9 (2.6 - 61) µg/ ml) and Polish donors (20 (5.6 - 119) µg/ml) and Dutch donors (23 (7.0 - 56) µg/ml) had similar levels.
The results of our study indicate that the composition of donor milk varies between donor populations in different countries. Further analysis is needed to see what causes these differences.

COD. P 78

A NEW ITALIAN HUMAN MILK BANK WAS CREATED SHORTLY BEFORE THE COVID PANDEMIC: A SCIENTIFIC AND CLINICAL CHALLENGE OF QUALITY

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The increasingly growing scientific evidence documents the importance of using Donated Human Milk (DHM) in neonatal intensive care units to improve the survival and quality of life of preterm infants or those affected by serious birth pathologies. Since November 2019, the Human Milk Bank (HMB) has been active at the Del Ponte Hospital in Varese, and since its inception, 416 liters of human milk have been collected and pasteurized, donated by 88 donors. The activity has been steadily increasing year after year, although there was a transient decrease due to the Covid pandemic. Specifically, here are the activity data for the year 2022:Total pasteurized DHM in 2022: 136 LNumber of donors: 27 (17 mothers of infants admitted to NICU/Neonatology, 10 mothers of healthy infants). In 2022, more than 80% of the milk was donated by mothers of infants admitted to NICU - Neonatology.Total number of infants fed with DHM: 82, including 75 premature infants (with birth weight < 1500 g), 4 infants with surgical pathologies (intestinal atresia/esophageal atresia), 2 infants with hypoxic-ischemic encephalopathy undergoing hypothermic treatment, and 1 infant with hemorrhagic gastroenteropathy.Furthermore, two other relevant aspects were: 1. the creation of the Milk Bank has generated great enthusiasm and positivity among all healthcare professionals in our departments (doctors, nurses, midwives), as well as among families; 2. medical students graduated with theses on the Milk Bank, and we have recently produced a scientific paper on the subject, accepted and published in a scientific journal (here the link to the published article), contributing to its credibility and authority.Breastfeeding and human milk bank in a neonatal intensive care unit: impact of the COVID-19 pandemic in an Italian cohort of very low birth weight infants. Bresesti I, Morlacchi L, Cazzaniga C, Sangiorgio C, Bertù L, Bolis ME, Bossi A, Agosti M.Int Breastfeed J. 2022 Dec 29;17(1):94. doi: 10.1186/s13006-022-00529-x.PMID: 36581945 Free PMC article.Objectives for 2023-2025: 1. collection of DHM at home: considering the potential workflow, it might be desirable to have 1 pickup every 7 days with a dedicated vehicle and volunteer staff; 2. by recovering more donated milk, it would be possible to extend the collection and supply of DHM to other neighboring neonatal intensive care units; 3. extensive distribution of brochures and informational materials in obstetric and neonatal clinics, Birth Centers, territorial midwifery clinics, family pediatricians' offices, community homes, and through the media.

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COD. P 79

MAY NEONATAL ADVANTAGES REPORTED IN PRETERM 1250 G EXCLUSIVELY FED WITH HIGH PROTEIN FORTIFIED HUMAN MILK PERSIST UNTIL TEN YEARS OF AGE?

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Preterm infants are at-risk for extrauterine growth restriction and downward percentile-crossing between birth and discharge. The objective of Nutritional support is to reduce growth failure, with special regard for lean body components that are dependent on protein intake. Previous literature described benefits of protein-fortification in ELBW infants' outcomes of during intrahospital and until the first 24 months of infant's corrected age (Mariani et al., 2018; Lin et al., 2019, 2022). Conversely, to our knowledge, no study has investigated the long-term impact. Therefore, the aim of this study was to evaluate if the positive intrahospital effects of enriched protein intake were detectable at scholar age. During the period 2008-2013, 61 preterm infants were fed according to different protocols of increasing protein fortification of human milk (34 babies were included into protein supplemented group-PSG and 27 into control group-CG) during intrahospital time. The same babies were included in a follow-up programme for preterm that required the assessment of anthropometric (weight, length, BMI) and psychoneurological outcomes until 24 months of corrected age. For the present study, renal function of all children was evaluated at 6 years of age. Furthermore, when children were around 10 years of age (range 8-11 years), all families were contacted by telephone and asked about willingness to participate to a further follow-up study; 22 and 11 families of children of the PSG and CG groups accepted: they received a booklet by mail containing questions about anthropometric data (child's weight and height) and a copy of Child Behavioral Checklist (CBCL; Achenbach, 1991), a well-established parent-reported measure of children's emotional and behavioural functioning. CBCL scores were allocated into two main scales, considering internalizing and externalizing symptoms difficulties. Renal function at 6.3 years of age (S.D. 1.7) resulted normal in both CG and PSG children. Assessment of anthropometric data showed a global homogeneity between groups. Indeed, no significant differences emerged between PSG and CG weight z-scores ($t(1.31)=.265$; $p=.793$), height ($t(1.31)=.877$; $p=.387$) and BMI ($t(1.31)=.076$; $p=.940$). The last result is particularly relevant, suggesting that, in our study, BMI of our patients (corrected for gestational age at birth) was normal with no significant statistical differences from two populations. We did not find trend to obesity in preterm patients, despite the hyperproteic nutrition administered in the first period of life. All patients practiced at least one sport regularly at the time of evaluation. The assessment of emotional and behavioral functioning showed specific profiles in children of the two groups. Specifically, a significant effect of the group emerged for externalizing symptoms scores ($t(1,32)= -2.453$; $p=.020$), where PSG children obtained higher (worse) scores than those of CG group (meanPSG=48.47±8.33;meanCG=41.83±6.12); interestingly this effect emerged only in case of maternal perceptions, while no significant different scores emerged for fathers of PSG and CG children ($t(1,32)= -1.305$; $p=.201$). This result could suggest potential vulnerabilities of these children, and requires further investigation, considering also the assessment by a clinician. Our conclusions are that supplemental enteral proteins lead to benefits that are restricted to the neonatal term and the first two years of age. References Achenbach, T. M. (1991). Manual for the Child Behavior Checklist/4-18 and 1991 profile. University of Vermont, Department of Psychiatry. Mariani, A.Biasini,L.Marvulli,S.Martini,A.Aceti,G.Faldella,L.Corvaglia,A.Sansavini,S.Savini,F.Agostini,
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COD. P 80

THE 41ST HUMAN MILK BANK OF ITALY IS BORN IN THE HISTORIC CITY OF SIRACUSA, SICILY: LAST BUT NOT LEAST

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The 41st Human Milk Bank (HMB) in Italy was inaugurated, with the first donors, on May 18th, 2023, at the Umberto I Hospital, Siracusa. It is the fourth HMB in Sicily after the ones of Palermo, Messina and Catania.It was a meaningful day, especially since May 19th is the World Day of Human Milk Donation. This is the most precious donation for fragile and premature VLBW babies (birth weight below 1,500 grams), when their mother's milk is not available."A small gesture can feed a big dream: Donate breast milk!" is the slogan chosen for this year, promoted in our country by AIBLUD (Italian Association of Human Milk Banks) and SIN (Italian Society of Neonatology). And now also in the most southern province of Italy it's possible the donation of human milk!The need to create a Human Milk Bank in Siracusa has become more and more pressing during a night shift in the delivery room when a woman with breast cancer was about to give birth. She had stopped chemotherapy during the pregnancy but she had to restart the treatment after the delivery. The gynecologist asked to the neonatologist on duty:"What milk will you give to this woman's baby?". The neonatologist replied: "We have no choice: formulated milk!". But he added: "If we had a donor human milk bank in Siracusa, we could feed her baby and also all fragile newborns in this province with this special gift."Infact, donor milk is an excellent therapeutic remedy that prevents a number of diseases by becoming a pharmacological tool for prevention and treatment. And also a further appeal to promote breast feeding, which is still hardly used in Sicily.The two doctors, involving the hospital leadership and private citizens with fundraising, allowed the birth of Siracusa's milk bank.The presence of four Human Milk Banks in Sicily would make possible to provide the wide territory of this great island, but this could happen just with the collaboration of the Regional Health Service and the newly formed Sicilian Coordination Network. They have to support the activity of the HMBs with the aim of standardizing and regulating the procedures adopted and making their activity more efficient. It's necessary to optimizing the clinical use of donated human milk and ensuring throughout Sicily the distribution of a standardized product showing high levels of safety and quality to protect donor mothers and the newborns who benefit from it.The Siracusa HMB, two months after its opening, is running and is feeding many premature babies, including those waiting for their mothers' milk. Naturally, the number of donors would have had to increase each month and year in order to provide this life-saving gift to the highest possible number of sick and fragile infants.

COD. P 81

IMPROVING THE UNDERSTANDING OF PHARMACEUTICAL INTAKE DURING LACTATION: IMPLICATIONS FOR DONOR RECRUITMENT BY HUMAN MILK BANKS

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Introduction: Demand for donor human milk (DHM) is growing as national and international guidelines make broader recommendations for its availability. Currently, most countries have strict guidance on donor recruitment, particularly for which medications can be taken without introducing any potential harm. A lack of research into the metabolism of pharmacological agents in the lactating breast means that little safety data is available for individual or combinatorial medications. In addition, there is no research into how processing may affect medication concentrations in DHM. Human milk banks therefore reject most donors taking any medications, limiting available DHM supply and preventing women fulfilling their wish to become a donor.Objective: To develop an open access medication database to support donor recruitment for human milk banks, and understand priorities for future research.Methods: A team of human milk banking, medical and pharmacist experts on drugs in lactation coordinated an initial survey of over 300 commonly used medications and topical agents. A database was created that assessed the level of risk of each agent for the purposes of milk donation, categorised against 'Use for all indications', 'Use for full-term, healthy infants only', 'Contraindicated for donation', and a final column was included to explain the deferral period if a medication is taken. Notes and references were included, and medications classified according to use class and route of administration. A retrospective review of donor questionnaires over a 2-year period was analysed to assess rate of medication use, and most common medications taken by prospective milk donors to the Hearts Milk Bank, UK.Results: The database was introduced into use in the Hearts Milk Bank, and staff were trained on its use. After 2 months, the database was also made available to all other milk banks in the UK. Engagement with the database was broad and productive, and a number of improvements and modifications were made in a rapid response cycle approach with iterative changes. Formal evaluation regarding the impact on ease of use and improvement in efficiency by milk bank staff, as well as impacts on donor recruitment, is ongoing. Overall, 47% of milk donors (n=589 reported using medications, of which the most common agents were paracetamol (19%), ibuprofen (12%), pregnancy/breastfeeding multivitamins (6%), sertraline (5%), and desogestrel (5%). A small number of milk donors (1%) did not declare medication use form the initial questionnaire, even though further questioning established they were.Discussion: Access to a reliable and regularly updated database may represent a significant advance in providing equitable opportunity to women to become milk donors, while also increasing the volume of available DHM. The Database is currently undergoing upgrade and review through the UK Drugs in Lactation Advisory Service (UKDILAS), with the aim of being made open access to members of the Global Alliance of Milk Banks and Associations after the EMBA conference

COD. P 82

UK HUMAN MILK BANKING: UNDERSTANDING RISK OF SERVICE EXPANSION AND PATHWAYS TO RESILIENCE

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Introduction: Interest in human milk banks (HMB) is increasing nationally and globally, with recent updated WHO guidance on the care of small and sick newborns recommending donor human milk (DHM) availability for all preterm infants, and a forthcoming BAPM Framework for Practice on the use of DHM in UK hospitals due for publication in 2023. Clinical and public awareness of the service is increasing, and a recent UK-wide survey of UK neonatologists suggests that 85% predict DHM usage in neonatal units will increase in the next 2 years. Methods: In November 2022, a workshop organised by the Human Milk Foundation brought together UK milk bank leaders, academics, and planners. The workshop aimed to understand existing pressures faced by UK HMBs and create a network to support strategic, evidence-based responses.Results: Emergent themes highlighted that HMBs are stretched, facilitated largely by goodwill. Most services are reliant on limited workforces with limitations in service continuity, training, and succession planning. COVID-19 exacerbated pressures, but led to HMBs cooperating more. Proposed responses included investment in staffing, training and IT resources, greater public awareness and inter-HMB cooperation, and a national HMB Risk Register. Service continuity needs to be urgently addressed through external multiagency engagement, operational support, and research prioritization (including qualitative, technological and implementation science), defining optimal service design and financial resourcing to meet nationally agreed needs. Conclusions: The goal of supporting lactation and parental choices through broadening DHM availability is achievable, but full understanding of potential harms to donors, recipients and HMB teams must be mapped out before implementation. Without intervention, the UK milk bank network may be unable to respond to future significant pressures, including specialist infant feed or infant formula shortages. With appropriate investment, a comprehensive National Service can be created to provide equitable services underpinned by robust research and innovation.

COD. P 83

EARLY-LIFE GUT MICROBIOTA AND NEURODEVELOPMENT IN PRETERM INFANTS: WHICH ROLE FOR DONOR HUMAN MILK?

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Background. Preterm infants are at increased risk for adverse neurological outcomes as well as gut microbiota (GM) dysbiosis. Interestingly, the GM and the nervous system share critical developmental windows in early life. Nutrition, notably the provision of exclusive mother's own milk (MOM), is known to affect both preterm infants' GM and neurodevelopment. The aim of this prospective pilot observational study was to explore the relationship between early life GM, feeding type and neurodevelopment in very low birth weight (VLBW) preterm infants.Methods. Clinical and nutritional data from birth to discharge were collected. Stool samples were collected at day 1, 4, 7, and 30 of life. Microbial DNA was subjected to 16S rRNA Illumina sequencing. Neurodevelopment was assessed at 24-month corrected age (CA) by General Development Quotient (GQ) of the revised Griffiths Mental Development scale.Results. Twenty-seven VLBW preterm infants were recruited. Median (interquartile range - IQR) gestational age was 30.6 (28.6-33.6) weeks and median (IQR) birth weight 1196 (917-1374) g. At 24-month CA, 21 infants had normal neurodevelopment (NN) and 6 showed neurodevelopmental impairment (NI). Infants with NI had higher need for surfactant administration (p=0.04). No other difference in clinical characteristics was described between infants with vs. without NI. With regard to nutritional data, there was no significant difference in the percentage of infants who were exclusively human milk, either MOM or donor human milk (DHM), fed between infants with NN and NI. Interestingly, among infant with NN during the period between day 8 and day 30 of life there were a higher total consumption (ml) of MOM milk compared to preterm formula milk (2005 ml IQR 1344-3779 ml vs 0 ml IQR 0-0 ml: p <0.0001), and compared to DHM (680 ml IQR 26.25-1889 ml: p= 0.006), with DHM consumption being higher than preterm formula milk consumption (p <0.0001). As for GM assessment, at day 30, Bifidobacterium abundance was positively correlated with the 24- month CA GQ score (p = 0.01, tau = 0.449). Bifidobacterium at day 30 was positively correlated
with total consumption of MOM (ml) between day 8 and 30 of life (p=0.02, R=0.515). No correlation Bifidobacterium at day 30 and DHM consumption score was found.Conclusion. Our data suggest an association between early-life GM and neurodevelopmental outcomes in VLBW infants. Although a clear mechanistic pathway linking the brain and GM in preterm infants has not yet been elucidated, it could be assumed that specific GM profiles could be the hallmark of neurodevelopmental vulnerability. Human milk may act as early mediator between the development of GM in early life and health outcomes with some differences between MOM and DHM. Holder pasteurization, which guarantees DHM microbiological safety, is also known to affect several nutritional and biological HM properties, thus impairing beneficial effect of DHM. Therefore, further knowledge and strategies are warranted in order to preserve and restore DHM properties

COD. P 84

MOTHER'S MILK IN CHRONIC KIDNEY DISEASE: A CASE-CONTROL STUDY

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Introduction: Breastfeeding and human milk are the reference normative standards for infant feeding and nutrition. Chronic Kidney Disease (CKD) is not an official contraindication for breastfeeding. Nevertheless, given the lack of evidence regarding how maternal CKD affects human milk composition, many clinicians prefer to apply a "precautionary approach" and discourage breastfeeding in mothers affected by renal failure.
Objective: Evaluate milk composition in mothers affected by CKD and its nutritional adequacy.Study design: Observational case-control study.
Methods: Pregnant women affected by nephrotic syndrome or CKD stage ≥ 3, followed-on in the Chronic Kidney Disease referral center of the Obstetrics and Gynecology Department, City of Health and Science of Turin, were recruited from February 2021 onward (n = 6). Each case was paired with 2 healthy controls, matched for gestational age at delivery (+/- 6 days). Milk was collected on the 7th-14th-28th-60th day post-delivery, stored at -20° and transferred to ISPA laboratories, Grugliasco, for analysis. Quantification and characterization of protein and non-protein nitrogen content was performed by using Dumas method and OPA method (Church, 1983), respectively. Auxological and neurodevelopmental follow-up of infants from nephropathic mothers was performed at 40 weeks and 3 months of corrected age, by measuring weight, length, head circumference and by administering Brazelton Neonatal Behavioural Assessment Scale (NBAS). Linear mixed models' analyses will be conducted to compare cases' and controls' milk content.
Results: 7 cases and 13 controls have been recruited. Of the 7 infants-cases, 4 received exclusive breastfeeding, 3 complementary breastfeeding. A preliminary comparison of milk nitrogen content between cases and controls showed non-significant differences in case of well-controlled kidney disease. Although, the milk non-protein nitrogen content was higher in one case that presented higher blood urea in the two months post-delivery. Infants' follow-up showed an appropriate growth and neurobehavioral development in 5 completed cases.Conclusions: this pilot study suggests that breastmilk from mothers affected by CKD retains its nutritional and biological properties, therefore, breastfeeding should be encouraged also in case of maternal CKD. Acknowledgement: the present study was supported by Fondazione CRT- Cassa di Risparmio di Torino (Mo.Mi.C.K. project).

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