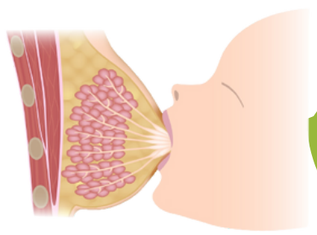
NON THERMAL PROCESSING OF DONOR HUMAN MILK

Universitat Autònoma de Barcelona

Mireia Puig Orriols

FINAL DEGREE PROJECT
JUNE 2023

INTRODUCTION



Nutrients

Water 87 %
Carbohidrates 7 %
Protein 0,9-1,2 %
Lipids 3-5 %
Vitamins
Minerals

Bioactive compounds

Immunoglobulins
Lactoferrin
Lysozyme
Cytokines
HMOs
BSSL
ALP

Benefits of BF

Complete nutrition
Enhances immune development
Pathogen protection
Gut colonization
Less gastrointestinal disease

[1]

HUMAN MILK BANKING

Collection
Processing
Storage (- 80 °C)

→ *Holder* pasteurization

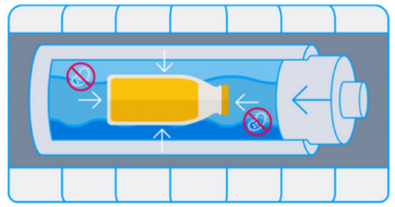
62.5 °C / 30 min [2]

Good compromise between the microbiological safety and nutritional quality

Alteration and the loss of activity of important bioactive components.

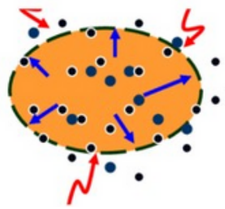
NON THERMAL TECHNOLOGIES

High hydrostatic pressure



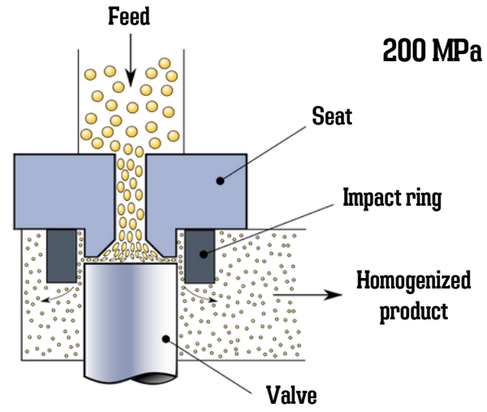
100 - 1000 MPa 5 - 30 min

Pulsed Electric Field



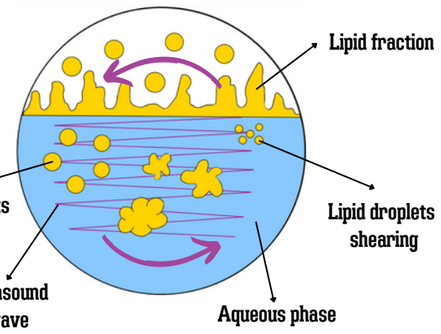
Cell lysis
6000 pulses at 15 kV and 20 Hz

High pressure homogenization

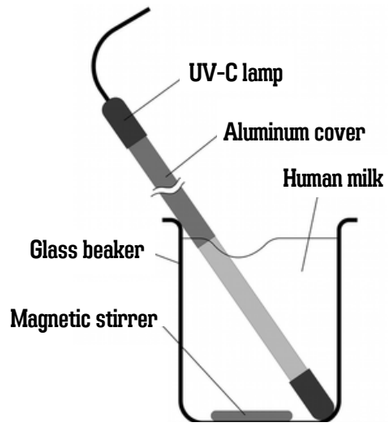


Ultrasounds

25.64 W
39 s



Ultraviolet C irradiation



254 nm
4863 J/L
26.5 min

[3] [4]

OBJECTIVES

- To explain the structure and general composition of human milk and its biologically active components.
- To describe what donation banks are and how they operate
- To explain each of the non-thermal technologies, describing their principles and conditions of use, their action on microorganisms, and their effect on bioactive components of human milk.

CONCLUSIONS

- Nonthermal technologies have a great potential in human milk processing.
- HPP, UV-C and US, are the most investigated. Other techniques are still in a primary lab-research stage.
- It is necessary to establish the optimal conditions for each technique and analyze all the components of interest.