

# **PASTEURIZATION OF BREASTMILK**

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New research from California confirms the safety of pasteurized mother's milk for HIV-exposed babies (Israel-Ballard, 2005). Two methods of heat-treatment, known as Flash-Heating and Pretoria Pasteurization, were compared to assess their impact on HIV and antimicrobial properties of breast milk, as well as on nutrient content. Milk samples were spiked with clade C HIV-1 (the sub-type found in areas of sub-Saharan Africa experiencing the highest prevalence of infection) and inoculated with common pathogens found in milk which may affect storage safety. 50 mL milk samples were then heat-treated by either method, using common household containers found in an ordinary home – a 1 Litre aluminium cooking pot containing 450 ml of water, and a 450 ml glass jar with a lid.

Flash-heating involves placing the uncovered jar of milk into pot of water and heating it over a cooking fire. Once the water boils, the milk is immediately removed from the water and allowed to cool.

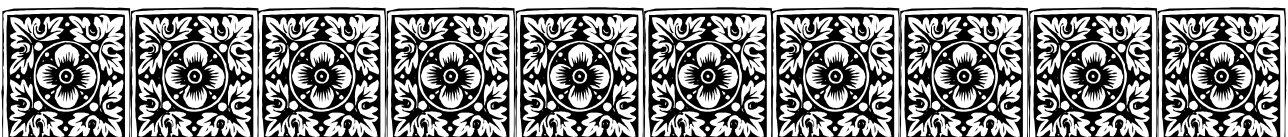
Pretoria Pasteurization involves boiling the pot of water and then it off the heat. The covered jar of milk is then placed in the hot water for 20 minutes, and then removed and allowed to cool.

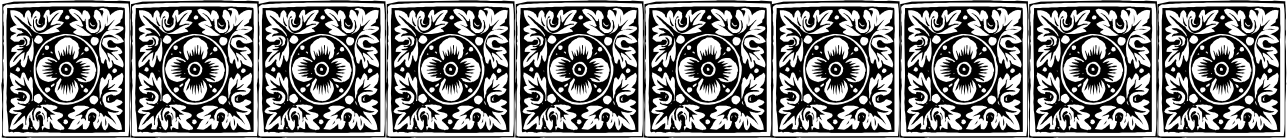
Flash-heated milk seemed to be more efficient in eliminating all viral activity and retained more antibacterial activity, but both treatments were shown to inactivate the virus and eliminate spiked bacteria in the milk. Neither method caused significant decrease in any vitamin (A, B<sup>6</sup>, B<sup>12</sup> and C, folate, riboflavin). Heat decreased immunoreactive lactoferrin, but not the proportions of lactoferrin and lysozyme surviving digestion.

This research has important practical applications. Pasteurization of mother's milk can be a useful technique for HIV-infected women who wish to feed their babies with their own milk, yet avoid any risk of postnatal infection from the virus through breastfeeding.

In addition, home-pasteurized breast milk can be used by mothers to treat and safely feed the milk from an affected breast during an episode of sore nipples or mastitis, eliminating the real possibility of not-enough-milk for the baby suddenly deprived of half his milk supply. Current guidelines to discard the milk from the affected breast, may inadvertently lead to an increased risk of mixed feeding, as the mother attempts to supplement her hungry baby with other foods and liquids, thus increasing the risk of transmission of HIV through breastfeeding.

Home-pasteurization may also be a way that mothers who are separated from their babies for short periods of time can leave breastmilk which can be safely stored without refrigeration. Because many mothers in developing countries do not have access to refrigeration, safe storage of expressed breast milk has been of particular concern. Contamination of expressed milk after pasteurization can result in rapid colonization. Breast milk from women who had been given no instructions about breast or hand-washing was pasteurized using the Pretoria method which was found to effectively kill commensal and pathogenic bacteria in expressed milk. (Jeffery 2003). Breast milk should be stored sealed in the container in which it was pasteurized to avoid the introduction of bacterial contaminants and is then safe





to keep for up to 12 hours without refrigeration, or up to 24 hours at 15°C, provided it remains sealed in the pasteurizing container and is not handled after pasteurization.

Pretoria pasteurization was implemented at Kalafong Hospital, South Africa, at the end of 2001 for feeding pre-term infants born to HIV-infected mothers. Mothers in the hospital found the method acceptable and easy to perform (Rollins 2004). Because 25% of the babies in the neonatal nursery received pasteurized breast milk instead of formula, the incidence of necrotizing enterocolitis was reduced in the following year by 72%. However, although heat-treated expressed breastmilk was recommended and supported at another South African site, it was poorly accepted. Reasons given by mothers for low uptake were that because there had been no official endorsement or media coverage of the method they lacked confidence in it.

The California results confirm the previous findings that Pretoria pasteurization is capable of killing common bacteria such as *Escheria Coli* and *Staphylococcus Aureus* in expressed breast milk allowing it to be safely stored without refrigeration for up to 12 hours. Low-tech home-pasteurization, using ordinary implements which can be found in simple homes in resource-poor areas offer a new, safe infant-feeding option for HIV-infected women. The use of cup-fed, heat-treated expressed breastmilk can avoid the risk of postnatal transmission of HIV whilst simultaneously enabling mothers to retain control over their infants' food security and provide them with the nutritional and immunological benefits of breast milk. In addition, teaching every mother how to comfortably and effectively hand express her breast milk is a strict requirement for every hospital that delivers babies and receives the Baby-Friendly Hospital accreditation. The challenge is to reassure decision-makers, health-workers and counselors in areas most affected by HIV that they can confidently promote this under-utilised, renewable resource as the superior method of replacement feeding.



## References

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