



## ORIGINAL ARTICLE

## Quality of human milk expressed in a human milk bank and at home<sup>☆,☆☆</sup>

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**KEYWORDS**

Human milk;  
Breast milk  
expression;  
Milk banks;  
Housing;  
Quality control

**Abstract**

**Objective:** To evaluate the quality of the human milk expressed at home and at a human milk bank.

**Methods:** This a retrospective, analytical, and observational study, performed by assessing titratable acidity records and the microbiological culture of 100 human milk samples expressed at home and at a human milk bank, in 2014. For the statistical analysis, generalized estimating equations (GEE) and the chi-squared test were used.

**Results:** When comparing the two sample groups, no significant difference was found, with 98% and 94% of the samples being approved among those collected at the milk bank and at home, respectively. No main interaction effect between local and titratable acidity records ( $p=0.285$ ) was observed, and there was no statistically significant difference between the expected and observed values for the association between the collection place and the microbiological culture results ( $p=0.307$ ).

**Conclusions:** The quality of human milk expressed at home and at the milk bank are in agreement with the recommended standards, confirming that the expression of human milk at home is as safe as expression at the human milk bank, provided that the established hygiene, conservation, storage, and transport standards are followed.

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**PALAVRAS-CHAVE**

Leite humano;  
Extração de leite;  
Bancos de Leite;  
Habitação;  
Controle de  
qualidade

**Qualidade do leite humano ordenhado em banco de leite e no domicílio****Resumo**

**Objetivo:** Avaliar a qualidade do leite humano ordenhado em domicílio e no Banco de Leite Humano.

**Métodos:** Estudo retrospectivo, realizado por meio da avaliação dos registros da acidez titulável e dos resultados de cultura microbiológica de 100 amostras de leite humano ordenhado em domicílio e em um Banco de Leite Humano, no ano de 2014. Para análises estatísticas foram utilizadas as Equações de Estimação Generalizadas (*Generalized Estimating Equations* - GEE) e o teste Qui-quadrado.

**Resultados:** Na comparação dos dois grupos de amostras, não foi detectada diferença significativa, sendo que 98% e 94% das amostras foram aprovadas entre as coletadas no Banco de Leite e em domicílio, respectivamente. Não foi observado efeito principal de interação entre local e grau de acidez titulável ( $p=0,285$ ) e não se constatou diferença estatisticamente significativa entre os valores observados e esperados para associação entre local de coleta e o resultado da cultura microbiológica ( $p=0,307$ ).

**Conclusões:** A qualidade do leite humano ordenhado em domicílio e no Banco de Leite Humano estão de acordo com o padrão preconizado, comprovando que a ordenha de leite humano em domicílio é tão segura quanto a ordenha no Banco de Leite Humano, desde que sejam seguidas as normas de higiene, conservação, armazenamento e transporte estabelecidas.

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**Introduction**

Situations such as prematurity, newborn hospitalization in a neonatal unit, maternal diseases, or low milk production may lead to difficulties in establishing and maintaining breastfeeding (BF).<sup>1</sup> Therefore, the use of donated human milk (HM) has become an efficient alternative for providing nutrition<sup>2</sup> to newborns in special conditions and a way of maintaining milk production by donor nursing mothers.<sup>3</sup>

In this sense, human milk banks (HMBs) are specialized services, responsible for actions of BF promotion, protection, and support, as well as the performance of activities of HM collection, processing, quality control, and distribution.<sup>3</sup>

The process used to define the quality of expressed human milk (EHM) is the result of adequate hygienic-sanitary conditions, from expression to administration, and the joint evaluation of several parameters, including nutritional, immunological, chemical, and microbiological characteristics, thus providing confirmation of the final product's safety.<sup>3,4</sup>

In Brazil, as well as in other countries, HM milking is allowed in the donor's home, provided that the established hygiene, conservation, storage, and transport standards are met.<sup>3,5-7</sup> This way, greater participation of donor nursing mothers is ensured and, consequently, a greater production of EHM.

In view of the importance of home milking as a strategy for collecting EHM and the lack of studies on the safety of this type of milking, it was considered important to evaluate the quality of the EHM at home and in the HMB.

**Methods**

A retrospective study was carried out by analyzing the records of the processing of the EHM samples in the year 2014 evaluated by the HMB of Hospital de Clínicas de Uberlândia, Universidade Federal de Uberlândia (HCU-UFU), Minas Gerais, Brazil. This study was approved by the Ethics Committee on Research with Human Beings of the institution where it was carried out, Opinion No. 1,289,959, of October 21, 2015.

To define the sample size, the calculation was performed using the G\*Power<sup>8</sup> program (Statistical power analyses, G\*Power 3.1, Germany), and the minimum total sample size was defined as 84 samples. It was decided to collect the data from 100 samples of EHM, representing 50 samples in each group (group 1: milking at home; group 2: milking at the HMB).

Simple random sampling was used for the selection of the analyzed EHM samples. Initially, the records of the nursing mothers registered in 2014 were identified and separated by place of milking, and two selections were carried out by drawing lots. In the first, fifty mothers were randomly selected in each group, and each mother had, on average, six samples of EHM; in the second, one of the EHM samples of each previously selected mother was selected by drawing lots.

Of the selected EHM samples, the results of the titratable acidity evaluation were initially collected, which identify the level of acidity expressed in degrees Dornic (°D) of raw EHM.<sup>1,3</sup> The HM has an original acidity with values ranging between 1 and 4°D, but under conditions that

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