



Physicochemical and bacteriological study breast milk of 10 lactating women in the city of Kenitra

Sultana Inekach*, Boutaina Laassili, Zineb Squalli Lhoussaini, Marieme Nehiri, Mohammed Ouhssine, Zineb Guessouss
Biotechnology Laboratory, Environment and Quality, Faculty of Sciences BP 133 14000 Kenitra, (MOROCCO)
E-mail: ouhssineunivit@gmail.com

ABSTRACT

The aim of this study was to evaluate the physicochemical and microbiological quality of breast milk from 10 lactating women in the city of Kenitra. The samples were returned to the laboratory of the Faculty of Sciences Kenitra for analysis.

The outcome obtained showed that the bacteria were present in the milk at a concentration of 2.10^3 - 8.10^4 for FMAT CFU, and CFU $1,86.10^2$ - $11,6.10^4$ concentration for lactic acid bacteria, with an average pH of 7.4 and an acidity of 0.026°D . We can say that breast milk is an environment in which grow more microorganisms at concentrations that do not exceed 10^3 - 10^4 . © 2015 Trade Science Inc. - INDIA

KEYWORDS

Physicochemical and microbiological quality;
Breast milk;
Lactic bacteria;
FMAT;
Lactating women.

INTRODUCTION

Breast milk is a complex biological liquid produced by the mammary glands^[1], of lactating mothers for their infant offspring whose knowledge keeps growing. Breast milk is the main source of nutrition for newborns before they become able to eat and digest other foods. It is acknowledged as the most important part of the postpartum in the metabolic and immunological health programming of newborns^[2].

It has exceptional amounts of nutrients and antibodies, hormones, growth factors, cytokines and immunocompetent cells. No other food is as natural and practical^[3].

Breast milk contains many antibodies and confines the development of certain diseases such as diarrhea, flu, asthma and allergies. The reasons for

these favorable properties, however, remain mysterious^[4].

In recent decades, bacteriological analyses of breast milk were conducted primarily to identify potential pathogens in milk banks or in cases of infection in the mother or child^[5].

MATERIALS AND METHODS

Sampling

This study was conducted on 10 women of low and medium socio-economic class living in the city of Kenitra.

10 lactating women provided samples of breast milk (colostrum, 1 month, 3 months, 6 months and 8 months) under sterile conditions. Lactating donors were asked to wash their hands and breasts with

warm water, after we completed the collection of breast milk in sterile plastic bottles by manual pressure. The samples were stored in the freezer.

Samples of fresh breast milk were tested physicochemical and bacteriological.

Physicochemical analysis of breast milk

pH

The pH of different samples of breast milk is measured by a pH meter type CONSORT C831 calibrated pH 4, 7 and 10.

Acidity

The acidity of the samples is determined by titration of the sample of milk by a solution of sodium hydroxide (NaOH), 0.1N in the presence of a colored indicator (1% phenolphthalein).

For 10 mL of the test sample was added a drop of 1% phenolphthalein.

The acidity is expressed by the one hundredth of lactic or degree Donnic acid °D.

$$\%Ac = \frac{\text{Vol (NaOH)} (\text{NaOH}) (\text{lactic acid weight}) * 100}{1000 (\text{sample mass})}$$

$$1^{\circ}D = 0, 1 \text{ g of lactic acid / liter.}$$

Microbiological analysis of breast milk

Microbiological analysis is an essential tool for the diagnosis of breast milk.

Préparation of dilutions

We have prepared a series of successive dilutions of 9ml prepared with sterile saline (0.9% NaCl) from the 10^{-1} dilution to 10^{-7} dilution. Dilutions are prepared in test tubes of 16/160 mm from 1ml of stock solution (breast milk).

Seeding

1ml of each dilution is placed in three Petri boxes of 9 cm diameter and 20 ml of agar medium previously sterilized at $120^{\circ}C / 15 \text{ min}$, under a pressure of 1 bar and cooled to $45^{\circ}C$, have been paid. The

box is then homogenized by manual shaking and incubated in an oven. Only the boxes whose number of colonies is between 30 and 300 are used for counting. The tests have been repeated three times. The boxes were incubated and immediately seeded in a jar micro aerobic atmosphere at $37^{\circ}C$ for 48 hours.

Determination of total aerobic mesophilic flora (FMAT)

It provides information on the overall bacterial load, estimated Nutritive Agar, incubated at $37^{\circ}C$ for 24 hours and is expressed in CFU [colony forming units].

Determination of the abundance of lactic acid bacteria

Lactic acid bacteria are likewise the germs which have biotechnological function. The best-known for their counting environment is MRS. Colonies from this group can be counted after incubation for 48 h at a temperature of 37. degree.

RESULTS AND DISCUSSION

Results

pH

As demonstrated in findings in the literature, which have shown that the pH of the milk is between 7.0 and 7.4, the average pH of the milk sample is about 7.4, which explains that breast milk is generally neutral or slightly alkaline. bibliographic reference^[6].

Acidity

The average acidity of samples of breast milk expressed in ° D is 0.023 ° D.

Discussion

Like the results of the Forum Nutricia Research on breast milk, Edition No. 2 • 2013, the results of many studies have shown that bacteria were present

TABLE 1 : Results of the microbiological analysis of samples of breast milk

	sample 1	sample 2	sample 3	sample 4	sample 5	sample 6	sample 7	sample 8
FMAT	$4,8 \cdot 10^3$	$4,22 \cdot 10^4$	$5 \cdot 10^4$	$4 \cdot 10^4$	$4 \cdot 10^4$	$8 \cdot 10^4$	$2,4 \cdot 10^3$	$2 \cdot 10^3$
Lactic bactéria	0	$3,5 \cdot 10^4$	$1,3 \cdot 10^4$	$11,6 \cdot 10^4$	$2,6 \cdot 10^3$	0	0	$1,86 \cdot 10^2$

Regular Paper

in breast milk at a concentration of 10^3 - 10^4 cfu / ml (CFU: Colony Forming Units), average counts of the microbial flora of breast milk varies between 2.10^3 and 8.10^4 UFC, and those of lactic acid bacteria varied between $1,86.10^2$ and $11,6.10^3$ which explains that these samples are not contaminated because they do not exceed the international standard is 10^5

These results show that bacterial growth is low in human milk^[7].

These results also show that the microbial composition of breast milk is really unique to each woman and influenced by many factors (his health and weight, and its mode of delivery).

BIBLIOGRAPHIC REFERENCE

- [1] M.Tackoen, Centre Néonatal, C.H.U.Saint-Pierre.
- [2] R.I.Cabrera-Rubio, M.C.Collado, K.Laitinen, S.Salminen, E.Isolauri, A.Mira; (Am.J.Clin.Nutr., sept., doi: 10.3945/ajcn.112.037382.Epub 2012 juill 25.), **96(3)**, 544-51 (**2012**)
- [3] Cabrera-Rubio R.1, M.C.Collado, K.Laitinen, S.Salminen, E.Isolauri, A.Mira; (Am.J.Clin.Nutr., sept., doi: 10.3945/ajcn.112.037382.Epub 2012 juill 25.), **96(3)**, 544-51 (**2012**).
- [4] Par Agnès Roux; Futura-Sciences,le 28/08/2013.
- [5] Forum Nutricia pour la recherche sur le lait maternel.
- [6] (Guo et al.; Composition, Physicochemical properties, Nitrogen fraction distribution, and Amino Acid Profile of Donkey Milk, J.Dairy Sci., doi:10.3168/jds.2006-600.medline), Composition, les propriétés physico-chimiques, De la distribution de la fraction d'azote, et le profil d'acides aminés du lait d'âne, Guo HY 1, K.Pang, X.Y.Zhang, L.Zhao, S.W.Chen, M.L.Dong, F.Z.Ren), http://fr.wikipedia.org/wiki/Lait_de_jument, Apports nutritionnels conseillés pour la population française, coordonné par A.Martin, Tec & Doc édit., Paris, **90**, 1635-1643 (**2001**); E.E.Birch et al.; Visual maturation of term infants fed long-chain polyunsaturated fatty acid-supplemented or control formula for 12 mo; Am.J.Clin.Nutr., Apr, **81(4)**, 871-9 (**2005**); E.E.Birch et al; A randomized controlled trial of early dietary supply of long-chain polyunsaturated fatty acids and mental development in term infants, Dev.Med.Child.Neurol., Mar, **42(3)**, 174-81 (**2000**).
- [7] La Leche League; allaitement et maternage, Mise à jour le Mardi, 19 Mai, 08:00, (**2009**).