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

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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 $2 \times 10^{-8}$ - $8 \times 10^{-4}$ for FMAT CFU, and $1.86 \times 10^{-11}$ - $6.1 \times 10^{-4}$ concentration for lactic acid bacteria, with an average pH of 7.4 and an acidity of $0.026 ^\circ$ D. We can say that breast milk is an environment in which grow more microorganisms at concentrations that do not exceed $10^{3}$ - $10^{4}$.

INTRODUCTION
Breast milk is a complex biological liquid produced by the mammary glands, 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.

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

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.

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.

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), 0.1 N 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 Donric acid °D.

\[
\% \text{Ac} = \frac{\text{Vol (NaOH)} \times (\text{NaOH}) \times (\text{lactic acid weight})}{1000 \times \text{(sample mass)}}
\]

1°D = 0, 1 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 9 ml 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 1 ml of stock solution (breast milk).

**Seeding**

1 ml of each dilution is placed in three Petri boxes of 9 cm diameter and 20 ml of agar medium previously sterilized at 120°C / 15 min, under a pressure of 1 bar and cooled to 45 °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 °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 °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>
<thead>
<tr>
<th>Sample</th>
<th>FMAT (CFU/ml)</th>
<th>Lactic bacteria (CFU/ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample 1</td>
<td>4.8 x 10³</td>
<td>0</td>
</tr>
<tr>
<td>Sample 2</td>
<td>4.22 x 10⁴</td>
<td>3.5 x 10⁴</td>
</tr>
<tr>
<td>Sample 3</td>
<td>5 x 10⁴</td>
<td>1.3 x 10⁴</td>
</tr>
<tr>
<td>Sample 4</td>
<td>4.10³</td>
<td>11.6 x 10⁴</td>
</tr>
<tr>
<td>Sample 5</td>
<td>4.10⁴</td>
<td>2.6 x 10³</td>
</tr>
<tr>
<td>Sample 6</td>
<td>8 x 10⁴</td>
<td>0</td>
</tr>
<tr>
<td>Sample 7</td>
<td>2.4 x 10³</td>
<td>0</td>
</tr>
<tr>
<td>Sample 8</td>
<td>2 x 10³</td>
<td>1.86 x 10²</td>
</tr>
</tbody>
</table>
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 $2 \times 10^3$ and $8 \times 10^4$ UFC, and those of lactic acid bacteria varied between $1.86 \times 10^2$ and $11.6 \times 10^3$ 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**