

Original article

Comparative Analysis of the Physicochemical Parameters of Breast Milk, Starter Infant Formulas and Commercial Cow Milks in Serbia

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SUMMARY

Data on the physical properties of cow milk and infant formulas are important since they indicate the differences in physicochemical and rheological characteristics and compatibility with natural breast milk. This fact is important not only for quality control but also for the use of these commercial products as infant diet supplements or as complete breast milk substitutes. This study was undertaken to determine refractive index, surface tension, pH, electrical conductivity, viscosity and titratable acidity of the UHT cow milk, starter infant formulas and breast milk of Serbian mothers in order to compare commercial milk formulations with natural human milk. The paper also presents the measured data of some physical parameters of human milk about which there is little information in the literature. It has been also demonstrated how these parameters were changed by freezing and prolonged storage of breast milk.

In this study, 8 commercial cow milks, 6 starter infant formulas and 15 different samples of colostrum, transition and mature breast milk were included. The titratable acidity, pH, electrical conductivity, refractive index, viscosity and surface tension were measured by using standardized techniques. It has been found that infant formulas available on the Serbian market differ in physicochemical parameters compared to breast milk. Regarding these parameters, none of the analyzed formulas fully corresponded to breast milk. It has been also shown that measurement of physical parameters is simple and inexpensive way to monitor the milk shelf-life which is important for human milk banks.

Key words: breast milk, infant formula, cow milk, physicochemical parameters

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