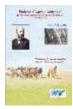


Butlerov Communications C Advances in Biochemistry & Technologies ISSN 2074-0948 (print)

2021. Vol.1, No.2, Id.4. Journal Homepage: https://c-journal.butlerov.com/



Full Paper

Thematic section: Biochemical Research. *Subsection:* Biotechnology.

The Reference Object Identifier – ROI-jbc-C/21-1-2-4 *The Digital Object Identifier* – DOI: 10.37952/ROI-jbc-C/21-1-2-4 Received 27 April 2021; Accepted 29 April 2021

Integral antioxidant activity of fermented baked milk from various manufacturers

Kamilla A. Nasrulina, Svetlana M. Gunicheva, Karina Yu. Sirotina, Yulia V. Shcherbakova,*+ and Farida Yu. Akhmadullina

Department of Industrial Biotechnology. Institute of Food Production and Biotechnology. Kazan National Research Technological University. Tolstoy St., 8. Kazan, 420015. Republic of Tatarstan. Russia. Phone: +7 (843) 231-95-91. E-mail: nuria1999@mail.ru

*Supervising author; *Corresponding author *Keywords:* fermented baked milk, antioxidant activity, malondialdehyde, coulometric titration.

Abstract

The great and ever-increasing interest in antioxidants is explained, first of all, by the fact that they provide the necessary activity of the antioxidant system, which prevents the accumulation of toxic oxidation products leading to various pathological diseases. First of all, they must be contained in sufficient amount in food that a person consumes. We studied the integral antioxidant activity of fermented baked milk samples from the following manufacturers: JSC Zelenodolsk Milk Processing Plant: LLC Kazan Dairy Plant; "Just milk"; JSC "Company UNIMILK-DANONE"; JSC "Wimm-Bill-Dann". The main research method was coulometric titration with electrogenerated bromine, which was carried out on an "Expert-006" coulometer (NPK LLC "Ekoniks-Expert", Moscow). Additionally, in order to confirm the results obtained, lipid peroxidation was determined by the content of malondialdehyde in the studied samples and titratable acidity. In addition, during the analysis of the obtained results, we evaluated the shelf life of the fermented milk product declared by the manufacturer. The results obtained for the integral antioxidant activity are in good agreement with the results for the content of malondialdehyde, which serves as an indicator of lipid peroxidation: its lowest amount was characteristic of the fermented baked milk of JSC Zelenodolsk Milk Processing Plant. Thus, it was revealed that fermented baked milk of JSC Zelenodolsk Milk Processing Plant possesses high integral antioxidant activity and can serve as a good source of antioxidants when introduced into the diet of the population.

For citation: Kamilla A. Nasrulina, Svetlana M. Gunicheva, Karina Yu. Sirotina, Yulia V. Shcherbakova, Farida Yu. Akhmadullina. Integral antioxidant

activity of fermented baked milk from various manufacturers. *Butlerov Communications C.* **2021**. Vol.1, No.2, Id.4. DOI: 10.37952/ROI-jbc-C/21-1-2-4.

References

- M.N. Oreshina. Dispersity of milk under various influences. *Dairy Industry*. 2009. No.3. P.32-33. (Russian)
- [2] I.F. Abdullin, E.N. Turova, G.Kh. Gaisina, G.K. Budnikov. The use of electrogenerated bromine to assess the integral antioxidant capacity of medicinal plants and preparations based on it. *Analytical Chemistry*. 2002. Vol.57. No.6. P.666-670. (Russian)
- [3] A.A. Lapin, V.N. Zelenkov, N.G. Romanov. Determination of antioxidant activity of fruit and berry raw materials and tea drinks by galvanostatic coulometry. *Moscow: RANS.* 2008. 42p. (Russian)
- [4] G.G. Tinyakov. Microstructure of milk and dairy products. *Moscow: Pishchpromizdat*. 1963. 178p. (Russian)
- [5] K.K. Gorbatova. Chemistry and physics of milk: textbook for universities. St.-Petersburgb: GIORD. 2003. 288p. (Russian)
- [6] G.V. Tverdokhleb, R.I. Ramanauskas. Technology and physics of milk and dairy products. *Moscow: DeLi Print.* **2006**. 360p. (Russian)
- [7] P.P. Stepanenko. Microbiology of milk and dairy products: textbook for universities. *Sergiev Pasad: Everything for you – Moscow Region.* **1999**. 415p. (Russian)
- [8] V.P. Shidlovskaya. Milk enzymes. Moscow: Agropromizdat. 1985. 152p. (Russian)
- [9] A.G. Bubnov, S.A. Buimova, A.A. Gushchin, T.V. Izvekova. Biotest analysis an integral method for assessing the quality of environmental objects: a training manual. *Ivanovo: Ivanovo State Chem. Technol. Universitet.* 2007. 112p. (Russian)
- [10] V.V. Zubov, N.Yu. Stepanov, A.M. Petrov, S.Yu. Selivanova, R.R. Shagidullin. Guidelines for biotesting of natural and waste waters. *Kazan: TPC Tabigat.* 2007. 65p. (Russian)
- [11] Sh.N. Reshetnik, F.G. Karimova, G.O. Ezhkova, E.K. Buntukova, Ye. Kanevskaya. The effect of the antioxidant acetate base mannich on growth, cAMP content and Ca²⁺ uptake by cells of the yeast Saccharomyces cereviciae. *Bulletin of the Russian Academy* of Sciences. Biological Series. 2000. No.3. P.392-396. (Russian)
- [12] O.A. Reshetnik, G.O. Ezhkova, E.G. Kanevskaya, P.A. Kirpichnikov. Regulation of growth, composition and physicochemical characteristics of Saccharomyces cerevisiae lipids by an antioxidant. *Bulletin of the Russian Academy of Sciences. Biological Series.* **1996**. Vol.346. No.5. P.705-707. (Russian)
- [13] Yu.V. Balakireva, A.A. Lapin, F.Yu. Akhmadullina, V.N. Zelenkov, F.G. Karimova. Galvanostatic coulometry to assess the antioxidant activity of milk and dairy products. *Scientific – methodical manual – Moscow: RANS.* 2009. P.60. (Russian)
- [14] A.M. Nizamov, G.K. Ziyatdinova, G.K. Budnikov. Electrically generated bromine. Coulometric reagent for assessing the bioavailability of polyphenols. *Scientific article – Journal of Analytical Chemistry*. 2011. Vol.66. No.3. P.308-316. (Russian)
- [15] Yu.G. Yuazarnova, B.Ya. Veretnov. Inhibition of radical oxidation of edible fats by flavonoid antioxidants. *Nutrition Issues.* **2004**. No.3. P.35-42. (Russian)
- [16] K.K. Gorbatova. Physics and biochemistry of milk proteins. Textbook for university students. *Moscow: Kolos.* **1993**. 193p. (Russian)
- [17] K.K. Gorbatova. Biochemistry of milk and dairy products: textbook for universities. 3rd ed., Revised. and add. *St.-Petersburgb: GIORD.* **2003**. 320p. (Russian)
- [18] I.Yu. Potoroko, V.V. Botvinnikova, I.V. Feklicheva. The influence of plant components on the activity of the symbiotic sourdough of kefir fungus and the formation of the quality of fermented milk drinks. *Bulletin of SUSU. Food and Biotechnology Series*. 2014. Vol.2. No.1. P.34-39. (Russian)

[19] Kamilla A. Nasrulina, Svetlana M. Gunicheva, Karina Yu. Sirotina, Yulia V. Shcherbakova, Farida Yu. Akhmadullina. Integral antioxidant activity of fermented baked milk from various manufacturers. *Butlerov Communications*. **2021**. Vol.66. No.5. P.111-116. DOI: 10.37952/ROI-jbc-01/21-66-5-111 (Russian)