ISSN: 2230-9926

Available online at http://www.journalijdr.com

IJDR

International Journal of Development Research
Vol. 08, Issue, 05, pp.20531-20534, May, 2018

ORIGINAL RESEARCH ARTICLE OPEN ACCESS

PHYSIOCHEMICAL CHARACTERIZATION OF THE RAW MILK MARKETED IN THE MUNICIPAL DISTRICT OF POMBAL, PARAÍBA, BRAZIL

***[1]Dayanne Kelly Pereira Abreu, [2]Yaroslávia Ferreira Paiva, [2]Kevison Romulo da Silva França, [1]Plínio Tércio Medeiros de Azevedo, [3]Everton Vieira da Silva, [2]Egle Katerinne Souza da Silva, [4]Anne Fabelly Ramalho Cezário, [5]Artur Xavier Mesquita de Queiroga, [6]Kariolania Fortunato de Paiva Araújo and [7]Francisco Arlindo Filho**

[1]Student Food Engineering, Federal University of Campina Grande, Pombal, Paraíba, Brazil
[2]Post-graduate Program in Agroindustrial Systems, Federal University of Campina Grande, Pombal, Paraíba, Brazil
[3]Teacher in Teacher Training Center, Federal University of Campina Grande, Cajazeiras, Paraíba, Brazil
[4]Post-graduate Program in Teaching, State University of Rio Grande do Norte, Natal, Rio Grande do Norte, Brazil
[5]Post-graduate Program in Process Engineering, Federal University of Campina Grande, Campina Grande, Paraíba, Brazil
[6]Post-graduate Program in Tropical Horticulture, Federal University of Campina Grande, Pombal, Paraíba, Brazil
7Bachelor in Dentistry, Faculdade Integrada de Patos, Patos, Paraíba, Brazil

ARTICLE INFO

Article History:
Received 15th February, 2018
Received in revised form
24th March, 2018
Accepted 17th April, 2018
Published online 31st May, 2018

Key Words:
Quality, Nutritional Security,
Food Security,
Informal Milk.

ABSTRACT

He is considered that about 20 to 30% of the production of bovine milk in Brazil is marketed without sanitary inspection, or appropriate thermal treatment. Therefore, it is of great importance to evaluate the milk in these places, like this, the study had as objective analyzes the physiochemical characteristics in samples of raw milk marketed in the municipal district of Pombal, Paraíba, Brazil. Samples were collected of each one of the five commercialization places, among the months of May and June of 2017, for subsequent characterization as for the pH, ashes, proteins, fat, lactose and solids no greasy. The obtained results demonstrated that the sample B was the one that presented larger number of no conformities. Already the sample A introduced no conformity just in relation to the pH, being verified the value of 6,42. As for the fat tenor, all of the samples were inside of the established patterns for the Brazilian legislation. The lactose tenors varied from 4,10% to 5,52% and they were inside of the intervals of values found by other authors. In spite of the milk to be considered informal, the results for the samples C, D and AND they were inside of the established patterns for the legislation for all of the analyzed parameters.

Citation: Dayanne Kelly Pereira Abreu, Yaroslávia Ferreira Paiva, Kevison Romulo da Silva França. *et al.* 2018. "Physiochemical characterization of the raw milk marketed in the municipal district of Pombal, Paraíba, Brazil", *International Journal of Development Research*, 8, (05), 20531-20534.

INTRODUCTION

Due to his/her high nutritional value, the milk is considered one of the most complete foods of the nature, being a great source of proteins, vitamins, fats, mineral salts, carboidratos, water and composed with high digestibilidade. That high nutritional load turns him/it essential for the human diet and a product thoroughly marketed and consumed by the population, above all for children and senior (SAVIOR *et al*., 2012; MARQUES *et al*. 2005). The consumption of the informal milk in Brazil is a popular practice mainly in the areas interioranas, being associated the factors cultural, regional and social. In spite of the danger that the product can offer to the consumer's health, factors as: praticidade, smaller price and the faith that the product coming directly from the producer is healthier than industrialized him/it, they are some of the justifications for the consumption of the milk in natura (BERSOT *et al*. 2010).

Corresponding author: **Dayanne Kelly Pereira Abreu,**
Student Food Engineering, Federal University of Campina Grande, Pombal, Paraíba, Brazil

The transport of this product is usually accomplished in trucks or motorcycles and stored in inadequate way without cooling or control hygienic-sanitarium. In consequence it can happen an increase in the microbial load, including microorganisms responsible patogênicos for several diseases of alimentary origin (CLAEYS *et al*. 2013). A high load of microorganisms mesófilos, psicrotróficos and/or termófilos in the milk degrade constituent or they produce substances capable to alter important physiochemical properties in the maintenance of the product and interfering directly in his/her quality (MARTINS *et al*. 2008). Of the economical point of view all of the events that happen since the moment of the it milks to the stage of commercialization of the informal milk can commit his/her quality (LIRO *et al*. 2011) and they interfere negatively in the productive chain of the milk and of yours derived (ABREU; MOÉSIA 2017). In that sense, the analysis of the physiochemical composition of the milk evaluates his/her quality legally in agreement with parameters established (AMARAL; SAINTS 2011) and through these, it is possible to determine the product is own or not for the consumption. Such parameters were established on September 18, 2002, for the Ministry of the Cattle Agriculture and Provisioning (MAPA), through the Department of Inspection of Products of Animal (DIPOA) Origin where the Instruction Normative no 51 was published, that it establishes criteria and identity parameters and quality of the milk, from it milks her/it to the transport, including physiochemical requirements and microbiológicos, counting of somatic (CCS) cells and maximum limits of antimicrobianos residues (LMR) (BRAZIL 2002).

The milk is a combination of several solid elements in water. The solid elements represent 12 to 13% of the milk and the water approximately approximately 87%. The main solid elements of the milk are lipids (3,5% to 5,3%), carboidratos (4,7% to 5,2%), proteins (3% to 4%), mineral salts and vitamins (1%). These components stay in balance, maintaining the relationship among them stable. The knowledge of that stability is the base for the tests that are accomplished with the objective of the occurrence of problems that you/they alter the composition of the milk appearing (SALOTTI *et al*. 2008). The "informal milk" marketed at Pombal (BR) is transported of the producer for the establishments in brasses for motorcycles or vans. The distribution is daily and the product is sold in bulk directly to the consumer. Therefore, this study was elaborated with the objective of evaluating the physiochemical quality of samples of raw milk marketed in the municipal district of Pombal, Paraíba, Brazil.

MATERIAL AND METHODS

The experiment was accomplished starting from the raw milk marketed in the municipal district of Pombal, Paraíba, Brazil, where initially an informative research was accomplished concerning the commercialization of this product type in the municipal district and starting from that, they were identified the sale point, being selected five of them, considering the with activity commercial lives intense, that were identified the: A, B, C, D and E. The samples were collected among the months of May to June of 2017, in five places. The same ones were obtained in sterile containers, later conditioned in box isotérmica and directed under cooling inside of the maximum period of 30 minute to the Laboratory of Chemistry, of the Center of Sciences and Tecnologia Agroalimentar (CCTA), of the Federal University of Campina Grande, (UFCG) it goes accomplishment of the analyses. The studied physiochemical characteristics understood the determination of the pH, Ashes (%), Proteins (%), Fat (%), Lactose (%) and Solids in the greasy (%), all the methodology described by the Instituto Adolfo Lutz (2009). The results were analyzed through variance (ANOVA) analysis and the averages were compared by the test of Tukeyattn the level of 5% of meaningfulness. All of the analyses were accomplished in triplicata.

RESULTS AND DISCUSSION

In spite that the appraised milk is considered as informal, it was adopted as referencial for analysis and interpretation of the results, the physiochemical patterns established by the Technical Regulation of Identity and Quality of Refrigerated Raw Milk (Brazil, 2011). The results obtained for the physiochemical analyses are described in the Table 1, presenting the medium values in the three weekly collections, following by the standard deviation. In agreement with the legislation, the pH of the milk for human consumption should be between 6,6 and 6,8. Below 6,6 acid is considered due to deterioration caused by microorganisms and larger than 6,8 are considered alkaline could present some adulteration type as fraud with water, milk with colostro, milk in beginning of fermentation process, among other (VALENCIA; PAIVA 2010). The pH values presented significant difference in the samples, where they varied from 6,42 to 6,76, and the A sample presented below a value that the established for the legislation. Santos Filho *et al*. (2016), he/she found pH values below the limits for 10 appraised samples of raw milk varying from 6,03 to 6,48. The inadequate cooling of the product, the use of utensils and equipments badly higienizados and the storage and inadequate transport favor the disordered proliferation of microorganismsdeteriorantes that you/they cause the decrease of the pH (he/she WHISTLES *et al*.; 2014). The values of ashes found in this study varied from 0,63% to 0,84%, where the sample and it differed estatisticamente of the others, with the highest value. Silva and Oliveira (2017), they found smaller values for six samples of raw milk marketed informally in the interior paraibano, varying from 0,45% to 0,74%.

Mineral substances act about 0,6-0,8% of the weight of the milk (gray - that the residue that is act after the milk was submitted to the incineration process). The calcium represents an important paper for human health, standing out among the minerals of the milk. However, still others exist mine in smaller amounts: sodium, potassium, magnesium, flúor, iodine, sulfur, copper, zinc, iron, etc. (TRUNK 2003). In agreement with IN 62 (Brazil, 2011) the milk with quality pattern for the consumer should contain at least 2,9% of protein. The values found for the analyses of proteins of the samples of the different sale points, they varied from 2,76% to 3,45%, where just the sample B is had been of the established pattern. However, the results are close of the values of proteins obtained by Amaral and Santos (2011) that evaluated the raw milk marketed in the city of Solânea-PB, and they found tenors from 2,24% to 3,15%. Motta *et al*. (2015), they found values varying from 2,5 to 3,9% of proteins in studies regarding the indicative factors of quality and composition of informal milk marketed in the southeast area of the state of São Paulo. It is important to emphasize that the amount of protein found in the milk, it can vary in agreement with the race, climate, season, handling, and other factors (MAGNAVITA 2012). The present fat in the milk has an important and characteristic functionality specific.

Table 1.Averages and standard deviation of the physiochemical parameters in percentage (%), found for the raw milk marketed at Pombal, Paraíba, Brazil

Parameter	A	B	C	D	E
pH	6,42±0,02[a]	6,64±0,01[b]	6,76±0,04[c]	6,75±0,02[c]	6,74±0,05[c]
Gray (%)	0,67±0,01[ab]	0,63±0,01[a]	0,69±0,01[b]	0,65±0,02[ab]	0,84±0,02[c]
Proteins(%)	3,10±0,01[ab]	2,76±0,02[a]	3,11±0,02[ab]	2,99±0,02[a]	3,45±0,03[b]
Fat (%)	3,35±0,03[a]	3,83±0,01[b]	3,75±0,02[c]	4,20±0,01[d]	3,25±0,01[e]
Lactose (%)	4,60±0,02[a]	4,10±0,02[b]	4,66±0,01[a]	4,53±0,02[c]	5,52±0,02[d]
Solids no greasy(%)	8,44±0,02[a]	7,53±0,02[b]	8,48±0,01[a]	8,21±0,02[a]	9,70±0,53[c]

Besides guaranteeing a larger source of energy, it possesses several properties that make possible the diversification in the milky industries, being responsible for great part of the sensorial characteristics of the product and by-products (SACRED; FONSECA 2007). For the analyses regarding the fat, IN 62/2011 establishes that the milk presents value of 3,0g/100g (3%). All of the appraised samples were inside of the patterns differing estatisticamente amongst themselves and varying between 3,35% and 4,20%. The study of Lima *et al*. (2016) that evaluated the raw milk marketed in municipal district inside Paraíba, he/she found satisfactory fat tenors in 75% of eight analyzed samples, being between 1,41% and 4,4%. The lactose tenors varied of 4,10% to 5,52% and only the samples E, C and D didn't differ estatisticamente amongst themselves at the level of 5% of significância. Oliveira *et al*. (2010), they found similar values for lactose, between 4,42% and 6,30% while they evaluated the physiochemical composition of milks in different nursing phases. The solids no greasy, that you/they understand all of the elements of the less milk the water and the fat, he/she has 8,4% as demanded minimum of the total in the milk (BELOTI, *et al*. 2011). Of the analyzed samples, just B had inferior value to the minimum demanded with 7,53% of solids no greasy, while the sample AND he/she obtained the largest value found with 9,70%. The other samples (E, C and D) didn't differ estatisticamente amongst themselves, with values of 8,44, 8,48 and 8,21 respectively.

CONCLUSION

In agreement with the obtained results, it can be ended that, the sample B was the one that presented larger number of no established conformities for the Brazilian legislation, evidencing possible frauds or mistakes committed from it milks it to the moment of his/her sale. Already the sample introduced A no conformity just in relation to the pH, being verified the value of 6,42. This fact can be explained by a possible addition of water to the milk. However, the points of sales of informal milk had an average of 75% of the samples (C, D and AND) inside of the established patterns for the legislation for all of the analyzed parameters, demonstrating an exempt milk of frauds.

REFERENCE

Abreu, D. D. C.; Moésia, R. R. Analysis microbiológica of the bovine milk no industrialized marketed in the city of Cajazeiras, Paraíba. Green magazine of Agroecologia and Maintainable Development, Dovecote.PB, v. 12, n.3, p.629-633, 2017.

AMARAL, C. R. S.; SAINTS, AND. P. raw Milk marketed in the city of Solânea, PB: Physiochemical characterization and microbiológica. Brazilian magazine of ProdutosAgroindustriais, Campina Big-PB, v.13, n.1, p.7-13 2011.

BELOTI, V.; RIBERIO JÚNIOR, J. C.; TAMANINE, R.; YAMADA, THE. K.; CAVALETTI, L.; SHECAIRA, C. L.; he/she WHISTLES, F. F. Quality microbiológica and physiochemical of the refrigerated raw milk, produced in the municipal district of SAPOPEMA / PR. Magazine Cient. Eletrôn.Med. Vet, v. 9, n. 16 2011.

BERSOT, L. S.; DAGUER, H.; MAZIERO, M. T.; I PAINT, J. P. THE.N.; BARCELLOS, V. C.; GALVÃO, J. THE. Raw milk trade: profile of the consumers and microbiological and physicochemical characterization of the product in Palotina-PR region. Magazine of Laticínios Cândido'sInstituteToasts, Juiz de Fora, v. 65; n. 373, p. 3-8 2010.

BRAZIL. Instruction Normative n°51 of September 18 of 2002.Ministry of the Agriculture and of the Provisioning, General office of Agricultural Defense 2002.

BRAZIL. Ministry of the Agriculture, Livestock and Provisioning.Instruction normative no. 62, of December 29 of 2011.Enclosure V. I Regulate Technical of Identity and Quality of the Refrigerated Raw Milk. Official diary of the Federal Republic of Brazil, Brasília, DF, 30 ten. 2011. Section 1, p.6.

CLAEYS, W. L.; CARDOEN, S.; DAUBE, G.; BLOCK, J.; DEWETTINCK, K.; DIERICK, K.; ZUTTER, L.; HUYGHEBAERT, THE.; IMBERTECHTS, H.; THIANGE, P.; VANDENPLAS, Y.; HERMAN, L. Raw or heated cow consumiption: Review of risks and benefits. Food Control, Oxford, v. 31, n. 1, p. 251-262 2013.

He/she FILES, THE. S.; it FILES, R. F.; he/she WHISTLES, AND. V.; TARGINO, THE. N.; TARGINO, M. V. P. physiochemical Patterns and microbiológicos of the raw milk marketed in municipal district inside Paraíba. Green magazine of Agroecologia and Maintainable Development, v.11, n. 3, p. 80-85 2016.

LIRO, C. V; FARM, R. AND. P; ZOCCHE, F. the consumer's of milk Profile in it is Worth him/it of Rio São Francisco, Pernambuco. Brazilian Animal science, v.12, n.4, p. 718.726, out / ten. 2011.

MAGNAVITA, THE. P. THE. Evaluation of the physiochemical characteristics and of the presence of antimicrobianos residues in milk pasteurized in the areas Southwest and South Baiano. 2012. 68p. Dissertation (Master's degree in Engineering of Foods).State University of the Southwest of Bahia, Itapetinga 2012.

MARQUES, M. S.; COELHO JÚNIOR, L. B.; SOARES, P. C. Evaluation of the quality microbiológica of the milk pasteurized type "C" processed in the state of Goiás. In: CON-GRESSO LATINO-AMERICANO 7.; BRAZILIAN OF HYGIENISTS OF FOODS 2., 2005, Búzios. Anal... Búzios 2015.

MARTINS, THE.M.C.V.; ROSSI JÚNIOR, O.D.; SALOTTI, B.M. *et al*. Effect of the processing UAT (Ultra High Temperature) on the physiochemical characteristics of the milk. Science Technology of Foods, v.28, p.295-298, 2008.

MOTTA, R. G.; he/she WHISTLES, THE. V.; GIUFFRIDA, R.; SIQUEIRA, THE.K.; PAES, THE. C.; MOTTA, I. G.; LISTONI, F. J. P.; BROOK, M. G. quality Indicators and composition of informal milk marketed in the Southeast area of the State of São Paulo. He/she researches Veterinary Brazilian, v. 35, n. 5, p. 417-423; 2015.

OLIVEIRA, AND. N. THE., *et al*. physiochemical Composition of milks in different nursing phases. Rev. Acad., Ciênc. Agrár.Ambient., Curitiba, v. 8, n. 4, p. 409-415 2010.

SALOTTI, B. M. *et al*. Effect of the processing UAT (Ultra High Temperature on physiochemical characteristics of the milk. Ciênc.Tecnol.Food.2008, v.28, n.2, p.295-298.

SAINTS SON, W. L. G.; DAYS, C. S.; I DIRTY, J. D. G.; SAINTS, AND. C. C.; he/she WHISTLES, THE. S.; ARAÚJO, THE. P. THE. physiochemical Characteristics of the marketed raw milk in an informal way in Redemption, Pará. Technology & Agricultural Science, João Pessoa, v. 10, n. 5, p. 29-34 2016.

SAINTS, M. V.; FONSECA, L. F. L. Strategies for mastite control and improvement of the quality of the milk.1.ed. Barueri: Manole 2007.

He/she WHISTLES, THE. R.; SANTOS FILHO, W. L. G.; DAYS, C. S.; SANTANA, J. F.; ARAÚJO, THE. P. THE.; PINE TREE, AND. M. C. physiochemical Analyses and fraud research in the informal milk marketed in Redemption. Shovel. In: Symposium of Studies and Researches in Environmental sciences in the Amazonian 3., 2014. Belém. Anal... Belém: University of the State of Pará 2014. V. 1, p. 201 -210.

He/she WHISTLES, G. W. N.; OLIVE TREE, M. P. physiochemical Evaluation of milk in natura marketed informally in the interior paraibano. Magazine Begins, João Pessoa, v. 1, n. 35, p. 34-41 2017.

TRUNK, V. M. Manual for inspection of the quality of the milk.2nd ed. Santa Maria, RS. 2003.

VALENCIA, A.L; PAIVA, J. AND. physiochemical Characterization of the pasteurized milk supplied by the program milk of Pernambuco in the metropolitan area of Recife. X teaching Day, researches and extension. Jepex 2010. UFRPE: Recife, 18 on October 22 of 2010.

****