



INVESTIGATION OF SOME CHEMICAL ADDITIVES FOR THE TYPES OF YOGHURT AVAILABLE IN THE MARKETS IN THE CITY OF BAGHDAD

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ABSTRACT

Yoghurt is one of the main foods eaten daily by humans and may be added to some chemicals that can be used in the food industry as preservatives. They act as micronutrients to preserve food for as long as possible or as substances to improve some of the physical properties of the product but according to standard specifications. It causes health damage to humans, including the infection of allergies and intestinal infections and others. This study was conducted on some types of local and imported yoghurt available in the markets of the city of Baghdad to detect chemicals in it and estimate, Formaldehyde, hydrogen peroxide, sodium bicarbonate and sodium benzoate. The results found that all samples under study were free of formaldehyde, hydrogen peroxide, sodium bicarbonate and sodium benzoate. These results are consistent with the Iraqi standard. This is a good indication that these products are free from chemical additives and are suitable for consumption Human.

KEY WORDS: dairy products, yoghurt, chemical additives, preservatives.

INTRODUCTION

Dairy products are essential nutrients needed daily to build and maintain health. They are rich in calcium, phosphorus, mineral salts and proteins as well as fats and fat-soluble vitamins^[1]. Their production is an important and necessary process for the safety of food, which must be subject to the conditions of health and safety of food^[2]. Addition of chemicals to dairy products as a food additives or preservatives that which added to keep their nutritional value, original chemical composition and physical properties of it^[3], the most likely additives are formaldehyde, hydrogen peroxide, benzoic acid, and its salts, sodium carbonate and sodium bicarbonate added to dairy products as neutralizers to preserve it for longer time and to prevent alteration and degradation by microorganisms during storage^[4]. The continuous use of these substances may be harmful to consumers and cause health hazards to the society^[5].

MATERIALS & METHODS

1. Collection of samples

Samples of the most popular yoghurt were collected from the various shops from local market of Baghdad, Iraq in May 2017. (See Table 1).

2. Chemical Tests

2.1. Detection of Hydrogen peroxide (Pien, 1953)^[6].

2 ml of sample were added in a test tube with 2 ml of Hydrochloric acid (1%), mixed Carefully and added 2 ml of potassium iodide (10%) the tube was immersed in hot water (80 °C) for 1 min then the tube was cooled in

running water, added 2 ml of starch solution (1%) as an indicator, when the sample contain hydrogen peroxide a blue color which appears.

2.2. Detection of formalin

This test done according to Hehner s test (Ling,1963)^[7],2 ml of sample were mixed with 2 ml distilled water in a test tube and then added sulphuric acid (90%) ,development of violet ring between the two layers refers to the presence of formalin.

2.3.Detection of sodium bicarbonate (Foley *et al.*, 1974)^[8].

0.5 ml Hydrochloric acid was added to 1ml of sample into a test tube, the positive sample showed effervescence due to formation of carbon dioxide gas , when this gas was directed into water , it makes it turbid.

2.4. Detection of Sodium benzoate^[9,10].

4.2.1. Prepare the standard solution: take 100.0 mg of sodium benzoate and dissolve it with 1000 ml of distilled water in a volumetric flask. Reduce the main solution by distilled water to get 10, 20, 30, 40, 50, 60 ml/L of sodium benzoate, add 0.4 ml of Hydrochloric acid to 5 ml of each standard solution and extracted after adding 45ml of petroleum benzene to measure absorbance for standard solutions at 227 nm used UV-Vis spectro photometry (UV-1100 Chrom teach, USA).

4.2.2. Preparation of samples: 10 g of yogurt is taken, 90 ml of distilled water and then mixed thoroughly for 2 minutes. After that the sample was filtered by the filter paper and 0.4 ml of hydrochloric acid is added to 5.0 ml of the sample. The sample was extracted by adding 45 ml of petroleum benzene for each sample.

TABLE 1: Chemicals added to the samples of yoghurt

NO.	trade mark	Date of production and validity	Origin	Notes
A1	Kala	21/4/2017 -20/5/2017	Iran	Free of the smell and impurities
A2	Activia 1	14/4/2017 -28/4/2017	Saudia Arabia	Free of the smell and impurities
A3	Activia 2	10/4/2017 -10/5/2017	Saudia Arabia	Free of the smell and impurities
A4	Mazaya	1/4/2017 -1/5/2017	Iraq	Free of the smell and impurities
A5	Shillan	2/4/2017 -1/5/2017	Iraq	Free of the smell and impurities
A6	Up	20/4/2017 -14/5/2017	Iraq	Free of the smell and impurities
A7	Mersin	3/4/2017 -30/4/2017	Erbil	Free of the smell and impurities
A8	Morsi	18/4/2017 -18/5/2017	Turkey	Free of the smell and impurities
A9	AlSafi	20/4/2017 -20/5/2017	Iraq	Free of the smell and impurities
A10	Rotash	23/4/2017 -23/5/2017	Iraq	Free of the smell and impurities
A11	Zakho	1/5/2017 -30/5/2017	Iraq	Free of the smell and impurities
A12	Erbil	3/4/2017 -3/5/2017	Erbil	Free of the smell and impurities

RESULTS & DISCUSSION**TABLE 2:** Chemicals added to the samples of yoghurt

Sample	Hydrogen peroxide	formalin	sodium bicarbonate	Sodium benzoate g/Kgm
A1	Nil	Nil	Nil	Nil
A2	Nil	Nil	Nil	Nil
A3	Nil	Nil	Nil	Nil
A4	Nil	Nil	Nil	Nil
A5	Nil	Nil	Nil	Nil
A6	Nil	Nil	Nil	Nil
A7	Nil	Nil	Nil	Nil
A8	Nil	Nil	Nil	Nil
A9	Nil	Nil	Nil	Nil
A10	Nil	Nil	Nil	Nil
A11	Nil	Nil	Nil	Nil
A12	Nil	Nil	Nil	Nil

*Results are rate 3 replicates

The results of the present study showed the absence of chemicals preservatives in all samples, whether local or imported. These results were consistent with the permissible limits in the standard formula [11, 12], these were also related to the [13] (FDO) is the absence used of preservatives in yoghurt and in the case of any preservative material, it suspends the license of any product contrary to the conditions, while these results were also compatible with [14,15,16]. Where the risk of preservatives and different types, although it limits the growth of germs, The existence of preservatives and a large percentage of commercial fraud, which lead to the health of the consumer to cases of vomiting and diarrhea as well as pain in the stomach and respiratory cramps and drowsiness as well For weak response to the nervous system [17].

REFERENCES

- [1]. Hanak, E., Boutrif, E., Fabre, P. and Pineiro, M. (2000) Food Safety Management in Developing Countries". Proceedings of the International Workshop, CIRAD-FAO, 11-13 December 2000, Montpellier, France, CIRAD-FAO.CIRAD CD-ROM, Montpellier, France, (2004).
- [2]. Oliver, S.O., Jayarao, B.M. and Almeida, R.A. (2005) Food borne pathogens in yogurt and dairy farm environment"food safety and public health environment. Food borne Pathog. Dis. 2: 115-129,
- [3]. Karima Mogahed Fahim Ahmed (2012) Detection of food safety hazards in milk and some dairy products, M.V.SC. Cairo University, Faculty of Veterinary Medicine, Department of Food Hygiene & Control, p.p. 1-2.
- [4]. Collins, E.B. (1967) Use of Preservatives in Milk and Dairy Products". Department of Food Science and Technology, University of California, Davis, Journal of Dairy Science, Vol. 50, NO. 4, p.p 601.
- [5]. Jahed, Kr, Gh. (2007) Chemical Contaminants in Milk and Public Health Concerns". A Review. International Journal Dairy Science, 2(2):104-105.
- [6]. Pien J., Desirant J., Lafontne, D. (1953)" Detectuon of hydrogen peroxide in milk ",Ann Falsif, Fraudes, Paris, Dairy Sci. Abst. 46:539/540,416-426.
- [7]. Ling, E.R (1963) A text book of dairy chemistry 3rd Ed. chapman and Hall LTD, London.
- [8]. Foley, J., Buchley, J., Murphy, M.F. (1974) commercial testing and product control in the dairy industry". Univesity College, Cork.
- [9]. ISO (1978) International Standard International Organization for Standardization. Geneva, Switzerland, (ISO) 5518.
- [10]. ISO (1983) International Standard International Organization for Standardization. Geneva, Switzerland, (ISO) 6560.
- [11]. Egyptian standard (155) "natural and chemical standard methods for testing dairy products",

- Egyptian General Organization for Standardization 1974.
- [12]. Saudi Standard (42) "Physical and Chemical Milk Testing Party", Saudi Arabian Standards and Metrology Organization, 1977.
- [13]. Belli, P., Cantafora, A., Stella, S., Barbieri, S. and Crimella, C. (2013) Microbiological survey of milk and dairy products from a small scale dairy processing unit in Maroua (Cameroon). *Food Control*, 32: 366-370.
- [14]. Gwin, M.C., Lienert, G., Kennedy, J. (2009) Formaldehyde exposure and asthma in children. A systematic review. *Environ. Health Prospect* 118: 313-317.9.
- [15]. Vice-Chancellery for Food and Drug of the Ministry of Health of Islamic Republic of Iran. (2009) The national rules for the natamycin usage in Doogh with act no. 16903.
- [16]. Sudad, J.M. (2015) Investigate the Microbial Load and Types of Preservatives Yogurt Available In Local Market", *Iraqi Journal of Market Research and Consumer Protection*, 7(2):43-46.
- [17]. WHO (2000) Guidelines for Benzoic acid and sodium benzoate /pdf .World Health Organization Geneva, available at www.who.int/cicad on 20 Oct 2015.