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Quality Evaluation of Soft Drinks Offered in Local Market

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Abstract: ***For evaluating the quality of soft drinksoffered in Iraqi market and to conform of its validity with Iraqi food legislation, this study was performed by collecting 12 samples of various soft drink brandswith different manufacturerfrom local market in Baghdad city for detecting their validity for human consumption compared with the Iraqi Standard of Soft Drinks. The test results demonstrated that 50% ofall samples tested are unsafe microbiological and 16% notconformed tochemical requirements related with sugar percentage in end product. These samples are considered not valid for human consumption.***

Keywords: Soft Drinks, Quality, Market

1. Introduction

Soft drinks, Anyway you say it, sparkling beverages are non-alcoholic, carbonated drinks containing flavorings, sweeteners and other ingredients.No matter what ittaste, sparkling beverages come in many forms, including regular, low-calorie, no-calorie, caffeinated and caffeine-free drinks(1).
It is important to the consumer to know the nutritional content of soft drinks before having, so it is necessary to read product labels which will provide, in accordance with local or regional labeling guidelines, for all soft drink products, with the exception of certain returnable bottles, fountain beverages and waters (unsweetened, unflavored), for which nutrition information is provided by alternate means, e.g., via corporate websites (2).

Consumers are always looking for new tastes and formats for soft drinks therefore, innovation is the key to success. For this reason, the soft drinks sector is one of the most fast-moving and dynamic industries in the food and drink manufacturing (3).

Without beverages we cannot live. It is recommended that adults consume approximately 2 liters of liquid daily and most that consumption comes from beverages. Those beverages range from water, soft drinks, coffee,tea, juice, milk…etc. This enormous variety and consumption of beverages provides an unlimited opportunity to study product development and manufacturing, human consumption behavior, physical health and happiness, sensory impacts, public policy and a host of other important topics. Soft drink consumption is increasing in many parts of the world (4). Because of introducing new brands of soft drinks in the local Iraqi market in last years by different manufacturerand to ensure of its quality, this investigation performed.

2. Materials and Methods

2.1 Collection of Samples

Various brands of soft drinks were collected, 12 samples collected from different places in Baghdad city in order to verify its quality,both of microbiological and chemical tested were done. The validity of all samples collected for testing was within the period specified by the manufacturer. Label information verified and recorded before testing at laboratories of Market Research and Consumer Protection Center/University of Baghdad. The information of all samples collected listed in Table 1.

Table 1: Soft Drink Samples

No.	Brand	Origin	Date of production and expiration	Labeling
1	Pepsi 250 ml	Iraq	1/5/2017 to 30/1/2018	All information
2	7 UP 250 ml	Iraq	19/10/2017 to 18/7/2018	All information
3	Miranda 250 ml	Iraq	24/1/2018 to 23/10/2018	All information
4	Coca Cola 330 ml	Iraq	6/2/2018 to 5/11/2018	All information
5	Sprite 355 ml	Iraq	18/11/2017 to 17/8/2018	All information
6	Cola Aldira250 ml	Iraq	10/10/2017 to 9/7/2018	All information
7	Cola RC 200 ml	Iraq	4/1/2018 to 7/1/2019	All information
8	Gazoz Reem180 ml	Iraq	29/1/2018 to 28/1/2019	All information
9	Apple Solaf 180 ml	Iraq	No found	Not all information
10	Gazoz Karawanchi 250 ml	Iraq	22/11/2017 to 21/8/2018	All information
11	Sinalco Orange 330 ml	Iraq	18/9/2017 to 19/6/2018	All information
12	Cola Zain 250 ml	Iraq	1/2/2018 to 1/11/2018	All information

2.2. Quality assessment

2.2.1. Sensorial assessment

Direct method (personal) was considered to determine the quality of collected samples (5). Sensorial qualities such as taste and flavor evaluated by assessors.Assessors recorded that all samples were acceptable in sensorial quality.

2.2.2. Microbiological assessment

Microbiological tests were carried out of soft drink samples according to (6, 7, and 8). 1 ml of eachsamples was taken for

testing, then decimal dilutions were prepared and planted in Petri dishes which contain suitable media to detect the type of microorganisms and its counting. The counting of microorganisms was done according to the Iraqi standard No.2270/6 of Microbial Limits in Food, Microbial Limits in Soft Drinks (9).

- Total Plate Count: Plate Count Agar is used as a media to estimate the total count of microorganisms.1 ml of each dilution put by a sterile pipette into a Petri dish individually and then the media pours after cooling to 45°C. The dishes are quietly moved to homogenize and to spread well and then left to solidify, Petri dishes inverted and incubated at 37°C for 24 hours, the number of developing colonies calculated in the dishes.
- Total Coliform bacteria: Violet Red Bile Agar (V.R.B.A) is used as media to estimate the numbers of coliform bacteria. The media poured into the dishes and left to solidify. 1 ml of the appropriate dilution put in the media and spread well on the surface and then pours another layer of media to provide non-aerobic conditions. Dishes left to solidify and then inverted and incubated at 37°C for 24 hours. Developing colonies in the media calculated to estimate the number of coliform bacteria.
- Yeast and Molds: 1 ml of each dilution placed in a petri dish then sabouraud Dextrose agar was poured into the center of the dishes after sterilization. The dishes were transferred to a fungicide incubator and incubated at 25 ° C for 3 - 5 days , developed colonies calculated to estimate the number of yeast and molds. Microbiological results illustrated in Table 2.

2.2.3. Chemical Assessment

Two chemical tests performed to all soft drinks brand samples. PH measured by PH meter and Brix grade % measured by Refractometer. Results of both tests illustrated in Table 3.

3. Results and Discussions

Microbiological test results demonstrated that 50% of allsamples (sex samples) tested are unsafe and not valid for human consumption compared withthe Iraqi standard No.2270/6 of Microbial Limits in Soft Drinks (9). Chemical test results demonstrated that16% of samples (two samples) are not conformed toIraqi standard No. 1127 of Soft Drinks related of sugar percentage in end product(10). Microbiological and chemical test results of various soft drinks samples illustrated in Table 2 and 3.

3.1. Microbiological Results

In accordance to Iraqi standard of microbial limits in soft drinks. Samples tested by counting: Total count of bacteria, Coliform bacteria and yeast and molds. Results illustrated in Table 2.

Table 2: Microbiological Results

No.	Brand	Total Coun CFu/1 ml	Coliform CFu/1 ml	Yeast CFu/1 ml	Molds CFu/1 ml
1	Pepsi 250 ml	Nil	Nil	Nil	Nil
2	7 UP 250 ml	Nil	Nil	1×10^1	1×10^1
3	Miranda 250 ml	Nil	Nil	Nil	Nil
4	Coca Cola 330 ml	Nil	Nil	1×10^1	3×10^1
5	Sprite 355 ml	5×10^1	Nil	4×10^1	6×10^1
6	Sinalco Orange 330 ml	6×10^1	Nil	5×10^1	4×10^1
7	GazozReem 180 ml	Nil	Nil	Nil	Nil
8	Cola Aldira 250 ml	Nil	Nil	2×10^1	Nil
9	RC 200 ml	Nil	Nil	Nil	3×10^1
10	GazozKarawanchi 250 ml	Nil	Nil	3×10^1	2×10^1
11	GazozSolaf 180 ml	Nil	Nil	Nil	Nil
12	Cola Zain 250 ml	Nil	Nil	1×10^1	1×10^1

3.2 Chemical Results

In accordance with Iraqi Standard of Soft Drink, both of sugar percentage (%Brix) and PH measured by Refractometer and PH meter. Results illustrated in Table 3.

Table 3: Chemical Results

No.	Brand	PH	Brix%
1	Pepsi 250 ml	2.9	10
2	7 UP 250 ml	3.3	11
3	Miranda 250 ml	2.5	14
4	Coca Cola 330 ml	2.6	10
5	Sprite 355 ml	3.3	15
6	Sinalco Orange 330 ml	3.4	5
7	GazozReem 180 ml	3.6	11
8	Cola Aldira 250 ml	3.2	2.5
9	RC 200 ml	3.1	10
10	GazozKarawanchi 250 ml	3.3	10
11	GazozSolaf 180 ml	3.1	9
12	Cola Zain 250 ml	3.2	10

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