TESTING OF THE HYGIENIC QUALITY OF THE CARBONATED SOFT DRINKS

Oneț Aurelia*, Oneț Cristian*

*University of Oradea, Faculty of Environmental Protection, e-mail: aurelia_onet@yahoo.com

Abstract

Soft drinks are enormously popular beverages consisting primarily of carbonated water, sugar, and flavorings. Nearly 200 nations enjoy the sweet, sparkling soda with an annual consumption of more than 34 billion gallons (Martin, 2007). The research was conducted in 2011 and the analyses have been carried out in the laboratory of the producers of soft drinks localized in Oradea. The objective of the work is in the final product quality testing to determine compliance with the standards in force. In terms of appearance, taste and smell the samples of the fresh bottled final products (juice on the basis of concentrated cola) were normal The monitored carbonated drinks contain a volume of CO_2 prescribed by the standards in force of the manufacturing companies in order to ensure the maximum acceptabiliate on the part of consumers. The values of the sugar content were classified with the standards in force.

Key words: quality, carbonated soft drinks, beverages.

INTRODUCTION

Carbonated soft drinks are widely consumed and present a unique problem to those drinking the products. Although they are water based, much of their taste and appeal comes from the addition of significant amounts of sugar, sugar substitutes and other chemicals that are harmful to health. A good portion of their appeal however, comes from the promotion of the products in a way that is attractive to younger customers (Mitchel, 1990).

Beverages containing significant amounts of sugars stimulate the pancreas, boosting insulin levels and removing the body from its natural fat burning state. Colas, in particular, contain caffeine, sugar, sodium and acid that are extremely destructive to human tissue.

A soft drink (also called pop, soda, coke, soda pop, fizzy drink, tonic, or carbonated beverage) is a non-alcoholic beverage that typically contains water (often, but not always carbonated water), a sweetener, and a flavoring agent. The sweetener may be sugar, high-fructose corn syrup, or a sugar substitute (in the case of diet drinks) (Louis, 1980).

A soft drink may also contain caffeine, fruit juice, or both. Examples of beverages not considered to be soft drinks are: pure juice, hot chocolate, tea, coffee, milk, and milkshakes. Soft drinks are called "soft" in contrast to "hard drinks" (alcoholic beverages).

Small amounts of alcohol may be present in a soft drink, but the alcohol content must be less than 0.5% of the total volume if the drink is to be considered non-alcoholic. Widely sold soft drink flavors are cola, cherry, lemon-lime, root beer, orange, grape, vanilla, ginger ale, fruit punch, and sparkling lemonade.

To impede the growth of microorganisms and prevent deterioration, preservatives are added to soft drinks. Anti-oxidants, such as BHA and ascorbic acid, maintain color and flavor. Beginning in the 1980s, soft drink manufacturers opted for natural additives in response to increasing health concerns of the public (Wolff, 2008).

Impurities in the water are removed through a process of coagulation, filtration, and chlorination. Coagulation involves mixing floc into the water to absorb suspended particles. The water is then poured through a sand filter to remove fine particles of Roc.

To sterilize the water, small amounts of chlorine are added to the water and filtered out. Most soft drinks are made at local bottling and canning companies. Brand name franchise companies grant licenses to bottlers to mix the soft drinks in strict accordance to their secret formulas and their required manufacturing procedures.

It is crucial for soft drink manufacturers to inspect raw materials before they are mixed with other ingredients, because preservatives may not kill all bacteria. All tanks, pumps, and containers are thoroughly sterilized and continuously monitored (Gibson, 2008).

Soft drink manufacturers also recommend specific storage conditions to retailers to insure that the beverages do not spoil. The shelf life of soft drinks is generally at least one year.

MATERIALS AND METHODS

The research was conducted in 2011 and the analyses have been carried out in the laboratory of the producers of soft drinks localized in Oradea.

The objective of the work is in the final product quality testing to determine compliance with the standards in force.

In March 2011 was tested a batch of 500 packages containing the same assortment of refreshing drink (carbonated juice on the basis of concentrated cola). Were analysed 10 PET bottles in that batch.

Samples of the fresh bottled final products (juice on the basis of the concentrated cola) were verified in terms of appearance, taste and smell, the sugar content and CO_2 content.

Table 1

The number of packages of sales subject to verification by consignment

The size of the lot, number of the packaging market	Number of packages of outlets that are subject to examination
500…1200	10
1200…3200	15
3201…10.000	20
10.001…35.000	40
35.001…150.000	70
150.001…200.000	120
200.001…300.000	210

The appearance of the final product

Sample of the final product fresh bottled was sensory verified to detect any traces of materials in suspension or floating and fragments of glass.

Criteria for acceptance of the results:

The sample is appropriate from the point of view of the layout if are not discover this foreign particles, sediments, fragments of glass, ring at the neck, molds, dust.

Taste and smell

The analyses of the taste and odor detect any flaws of taste or of foreign tastes from ingredients and the evaluation of properties of the drinks from the standpoint of the consumer.

It utilizes beakers. Pour, taste and smell. The product must have a normal taste and smell, specific flavour of which is prepared. The sample is appropriate to taste if not present excessive sweetness, acid taste, metallic taste, fermented or oxidized taste, molasses and plastic taste. The sample is appropriate in terms of smell if not presents strong carbon dioxide, yeast or any other non-smell of the aroma of the product.

Content of sugar

Determination of the content of sugar in products with sugar is expressed in degrees Brix. For this determination was used oscillating PAAR DMA 48, plastic syringe of 5 or 10 ml, ultrasound bath, plastic bowl. Criteria for acceptance of the results: 10,50+/-0,15.

The content in CO_2

All the carbonated drinks must contain a volume of CO_2 prescribed by the standards in force of the manufacturing companies in order to ensure the maximum acceptabiliate on the part of consumers.

Bottle of booze gathered on the bottling line shake vigorously several times in order to expedite the establishment of the balance between

the physically dissolved gas and the gas present in the atmosphere above the drinks.

Table 2

Specifications for the final product

Taste and smell	Normal
Appearance	Clear beverages must be free of sediment, including suspended particles or floating without ring on the neck of the bottle and normal color. Drinks with or without fruit juice must have normal opacity with a very small ring or lack of it.
^{0} Brix	In accordance with the instructions for mixing, 10,50+/- 0,15 ^{0} Brix
Content in CO_2	In accordance with the instructions for mixing, 5 g/l min.

RESULTS AND DISCUSSION

Soft drinks may be served chilled or at room temperature. They are rarely heated. Of most importance is that the ingredient meets the agreed specification on all major parameters. This is not only the functional parameter (in other words, the level of the major constituent), but the level of impurities, the microbiological status, and physical parameters such as color, particle size, etc.

Carbonated water constitutes up to 94% of a soft drink. Carbon dioxide adds that special sparkle and bite to the beverage and also acts as a mild preservative. Carbon dioxide is an uniquely suitable gas for soft drinks because it is inert, non-toxic, and relatively inexpensive and easy to liquefy.

The second main ingredient is sugar, which makes up 7-12% of a soft drink. Sugar also balances flavors and acids. Other sugar substitutes were introduced more successfully, notably aspartame, or Nutra-Sweet, which was widely used throughout the 1980s and 1990s for diet soft drinks (Louis, 1980). The overall flavor of a soft drink depends on an intricate balance of sweetness, tartness, and acidity (pH). Acids add a sharpness to the background taste and enhance the thirst-quenching experience by stimulating saliva flow. The most common acid in soft drinks is citric acid, which has a lemony flavor. Acids also reduce pH levels, mildly preserving the beverage.

In terms of appearance, taste and smell the samples of the fresh bottled final products (juice on the basis of concentrated cola) were normal, free of sediment including suspended particles or floating. Also, have not been identified rings on the neck of the bottle.

The results of the content in sugar and CO_2 are presented in the following table (3, 4).

Table 3

The content in sugar of the fresh bottled juice on the basis of concentrated cola

Determinations	Content in sugar (^{0} Brix)
1	10,1
2	10,3
3	10,2
4	10,5
5	10,4
6	10,3
7	10,1
8	10,2
9	10,1
10	10,6
media	10,2

Table 4

The content in CO_2 of the fresh bottled juice on the basis of concentrated cola

Determinations	Content in CO_2 (g/l)
1	5
2	5,1
3	5,2
4	5,5
5	6,5
6	6,3
7	6,1
8	6,2
9	5,1
10	6,6
media	5,7

The physical parameters of the monitored fresh bottled juice on the basis of concentrated cola have been in accordance with the preparation instruction of the carbonated soft drinks manufacturer.

Soft drink manufacturers adhere to strict water quality standards for allowable dissolved solids, alkalinity, chlorides, sulfates, iron, and aluminum. Not only is it in the interest of public health, but clean water also facilitates the production process and maintains consistency in flavor, color, and body. Microbiological and other testing occur regularly. The manufacturers of the carbonated soft drinks and other agencies set standards for regulating the quality of sugar and other ingredients. If soft drinks are produced with low-quality sugar, particles in the beverage will spoil it, creating floc. To prevent such spoilage, sugar must be carefully handled in dry, sanitized environments.

CONCLUSIONS

Soft drinks are enormously popular beverages consisting primarily of carbonated water, sugar, and flavorings. Soft drinks are subject to constant quality control.

In terms of appearance, taste and smell the samples of the fresh bottled final products (juice on the basis of concentrated cola) were normal

The values of sugar content and CO_2 content were classified with the standards in force.

REFERENCES

1. Ashurst, P. , 2009, Soft drink and fruit juice problems solved. Woodhead Publishing Limited;
2. Gibson, Sigrid, 2008, "Sugar-sweetened soft drinks and obesity: a systematic review of the evidence from observational studies and interventions". Nutrition Research Reviews;
3. Louis, J.C., 1980, The Cola Wars. Everest House;
4. Martin Hickman Caution, 2007, Some soft drinks may seriously harm your health, The Independent on Sunday;
5. Michael F Jacobson PhD, 2005, Liquid Candy: How Soft Drinks are Harming Americans' Health, Washington DC.;
6. Mitchell, Alan J.,1990, Formulation and Production of Carbonated Soft Drinks.;
7. Oliver, Thomas, 1986, The Real Coke. Random House;
8. Riley, John J. 1972, A History of the American Soft Drink Industry. Arno Press;
9. Tordoff, M.G.; Alleva, AM., 1990, Effect of drinking soda sweetened with aspartame or high-fructose corn syrup on food intake and body weight, American Journal of Clinical Nutrition;
10. Vartanian, L.R.; Schwartz, M.B.; Brownell, K.D., 2007, Effects of soft drink consumption on nutrition and health: a systematic review and meta-analysis, American Journal of Public Health;
11. Wolff, E.; Dangsinger, M.L., 2008, Soft drinks and weight gain: How strong is the link?, Medscape Journal of Medicine.