

ANALYSIS OF THE PRESENCE OF ADDITIVES IN SOME RANGE OF DIETETIC ICE CREAM

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ABSTRACT

În cadrul acestui studiu se dorește o evaluare calitativă succintă a unor sortimente de înghețată dietetică (înghețată cu aromă de fructe și topping de amarena, înghețată cu frișcă și sos de fructe de pădure, înghețată Sky cu aromă de căpșuni), evaluarea bazându-se pe identificarea substanțelor de aditivare prezente pe eticheta probelor cu stabilirea claselor din care fac parte și a riscului de consum pentru fiecare aditiv identificat. De asemenea, evaluarea calitativă are la bază și o analiză organoleptică urmărindu-se parametrii specifici: aspect general, gust, miros, culoare.

In this study, a brief qualitative assessment of a range of dietetic ice cream (ice cream with aroma of fruit and amarina topping, cream with cream and forest fruit sauce, Sky with strawberry flavor) is desirable, the assessment based on the identification of the additive substances present on the sample label with the determination of the classes of which they belong and the risk of consumption for each identified additive. Also, the qualitative assessment is based on a sensorial analysis, following the specific parameters: general appearance, taste, odor, color.

INTRODUCTION

Hypo caloric dietary ice cream is the product where sugar is replaced by a non-nutritive sweetener such as sorbitol (about 15%) and the mix has only 0.9% fat (by Warren, 2014, Amador, 2017).

The auxiliary raw materials used in the manufacture of ice cream are: milk and dairy products, sweeteners, stabilizers, emulsifiers and flavorings and dyes. The quality of each ingredient is monitored from a biotechnological, microbiological, physic-chemical and sensory (by Banu 1993, Banu et al 2009). Both classic and dietetic ice cream contains vitamins (especially vitamin A and complex B) and mineral salts generally represented by Ca and P salts. For choosing the dairy product used in ice cream production, the following aspects are taken into consideration: Grade the product's perishability, the equipment used to homogenize and pasteurize the product, the degree of availability of the product, the effect of the product on the ice cream, namely the taste, smell and texture, the price of the chosen dairy product (by Banu, 1993, Jimborean, 2009, Cook, 2010).

The quality of fresh milk used as raw material to obtain ice cream influences both the technological process and the quality of the finished product (by Reithofer, 2011). Milk and dairy products have the capacity to provide biologically active components (especially vitamins and trace elements) that are fundamental to the promotion of human health (Gus, 2002, Baldi et al., 2005 Jimborean, 2009, Savescu, 2009, Soukoulis, 2014). Fats can provide significant protein intake (Ruger et al., 2002, Shaviklo, 2011). Ice cream is a food offering to the liking of consumers, and because it can be obtained by mixing more raw materials, the perceived organoleptic sensations are multiplied by the richness of nutrients found on the label (by Tosaki et al., 2009, Dickinson, 2013).

The main characteristic of a quality ice cream is the specific flavor. The main synthetic flavorings encountered in the ice cream are vanillin, ethyl acetate, butyl acetate, cinnamic

aldehyde, benzyl ethyl aldehyde valerate. Colorants used for making ice cream are synthetic and natural (Scorei, 2004).

MATERIALS AND METHODS

The material used for analysis in this study was made up of three types of dietetic ice cream: ice cream with fruit flavor and amarena topping, cream with cream and forest fruit sauce, Sky ice cream with strawberry flavor and a classic ice cream type : ice cream with fruit.

Analysis of ice cream samples taken into study consisted of: random choice of dietetic ice cream samples; analysis of the label to determine the number of synthetic additives for all analyzed samples; classification of additives on quality classes; sensorial analysis.

Label analysis was performed meticulously resulting in the identification of the additives present and their classification as well as the toxicity analysis.

During the taking and the formation of samples for sensorial determination, the general appearance was examined visually, and elementary samples were compared in terms of aspect, color, smell, taste for the purpose of determining as accurate as possible (by Capruciu, 2013).

RESEARCH RESULTS

In order to carry out the study, the idea of informing the consumer on the number and the group of additives by analyzing the label of several brands of dietetic ice cream was sought, in particular by identifying and analyzing the additive classes. Besides the raw materials of the dietetic ice cream, there are a wide range of additives (sweetening agents - corn sugar and corn syrup, binders, emulsifiers, stabilizers, flavoring and coloring agents, thickening and texturing agents - gelatin and carboxymethylcellulose) substances with a well-defined role in order to obtain a good and appealing commercial product.

In the three analyzed ice cream assortments, 27 food additives were identified which were grouped in Table 1.

From a first analysis of Table 1 we can observe the multitude of additive substances present in the dietetic composition of the study. P1 has the largest number of additive classes in the three samples studied, many of which are not indicated in children's products. It is also noted that both the sample label P1 and the sample label P2, present additives do not present Codex Alimentarius identification code consisting of the letter E and a number of digits. This may discourage buyers who have become accustomed to finding the additive code on the labels lately. The lack of code may induce the impression of the lack of additive substances in the composition of the product purchased for consumption. Only a careful assessment (carefully reading the label highlights the large number of additives).

Thus, we find that in the P1 sample (fruit flavored ice cream and amaranth topping) we have 18 additives from different classes: acidifiers, flavoring substances, emulsifiers, gums, natural and identical natural flavors, colorants, thickening agents, stabilizers, acidity correctors, preservatives. In the composition P2 (whipped cream and forest fruit sauce) there are 13 additives from different classes: emulsifiers, stabilizers, thickeners, acidifiers, colorants, acidity correctors.

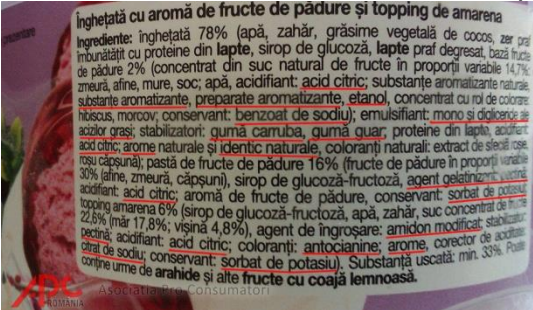
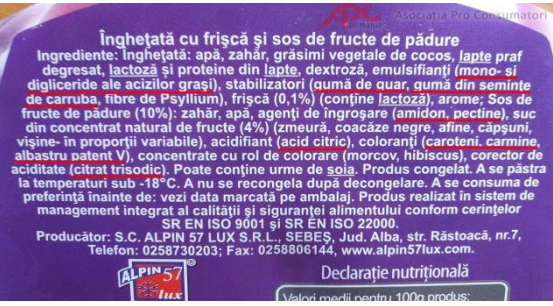
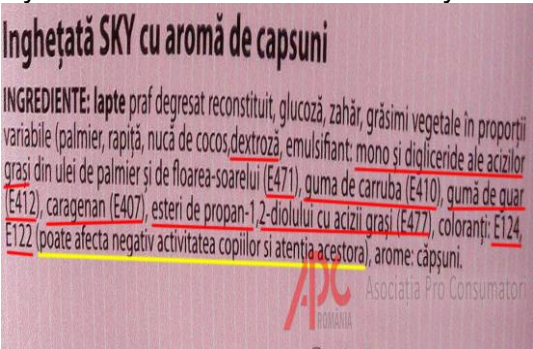
In the composition of the P3 sample (strawberry flavored Sky) there are 9 additives from different classes: emulsifiers, gums, dyes, flavors.

Specialty studies say that in the composition of each type of industrial dietetic ice cream there are on average 20 ingredients, compared to traditional ice cream, where 6 ingredients are used on average.

In this study, only the number of synthetic additives reached 27 (the total number being well above the average given by specialists in the field).

Additives present in studied dietetic ice cream samples

Tabel 1

Types of ice cream	Types of additives
<p>Fruit-flavored ice cream and P1 amber topping</p> 	<p>Acidifying agent: citric acid, flavoring substances, dextrose, ethanol, sodium benzoate, emulsifiers: mono and diglycerides of fatty acids, carob gum, guar gum, natural and identical natural flavors, dye: strawberry red, gelling agent: pectin, , thickening agent: modified starch, stabilizer: pectin, acidity corrector: sodium citrate, preservative: potassium sorbate</p>
<p>Ice cream with cream and P2 fruit forest sauce</p> 	<p>Dextrose, emulsifiers: mono and diglycerides of fatty acids, Stabilizers: guar gum, carob gum, Psyllium fiber, thickening agent: starch, pectin, acidifier: citric acid, dyes: carotenes, acidity corrector: trisodium citrate</p>
<p>Sky ice cream with P3 strawberry flavor</p> 	<p>Dextrose, mono and diglycerides of palm oil and sunflower fatty acids (E471), carob gum (E410), guar gum E412, carrageenan E407, propane esters 1,2, diol with fatty acids E477, dyes : E124, E122, flavors: strawberries.</p>

The legislation in force states that on a label the ingredients are mentioned in descending order of the quantity found in the foodstuff, that is, the first ingredient is found in the product in the largest quantity, the second ingredient is found, a smaller quantity than the first, and so on

Analyzing the label, it is clear from this point that in the samples taken at the P2 and P3 samples the highest amount of added synthetic additive is dextrose, and in the sample P1 the highest amount of synthetic additive added is citric acid. Starting from the identification of these additives in the highest percentage of percentage, a brief analysis of them is required.

The main biotechnological aspects in evaluating a range of ice cream are mainly transposed into ice cream defects. Ice cream presents a number of defects, the most common being organoleptic: aroma, texture and color. Ice cream like any food is assessed biotechnologically by STAS, following the admissibility conditions (Table 2). In the ice cream, special attention should be paid to the homogeneous consistency, the lack of large ice crystals, the softening point, and the observance of the recipe.

Table 2

Organoleptic characteristics of analyzed types of ice cream

Sensorial characteristics	Fruit-flavored ice cream and P1 amber topping	Ice cream with cream and P2 fruit forest sauce	Sky ice cream with P3 strawberry flavor
Color	uniform, reddish, characteristic of the more intense cherries on the surface due to the bitter melting	uneven, white with intense reddish-blue blooms, characteristic of the shade of the dye additives for the more intensive forest fruits on the surface due to the berries topping	uniform, rosé, characteristic of strawberries, uniform throughout the table
Smell	Pleasant bitter cherries	Pleasant, whimsical whipped cream of berries	Pleasant strawberry
Taste	sweet, sweet sour, corresponding to the cherry flavor bitter on the surface	pleasant, deep cream followed by a few seconds of sweet sour, corresponding to the berry fruit flavor more intense to the surface	pleasant, sweet fragrance, corresponding to the strawberry flavor of the same intensity in the whole meal
Structure and Consistency	smooth, homogeneous throughout the table, without ice-precipitous crystals		

The sensorial evaluation of the ice cream samples taken in the study did not reveal any major defects. However, it can be mentioned, from the category of flavor defects, the slightly sour, poorly perceptible taste of fruit milk ice cream.

CONCLUSIONS

The brief analysis of the three ice cream samples taken in the analysis reveals a negative aspect in terms of the presence of the additives.

Thus, in the P1 sample we have a number of 18 additives from different classes, in the composition of the P2 sample there are a number of 13 additives from different classes and in the composition of sample P3 we found 9 additives from different classes. Although the P3 sample is labeled correctly (the additive code is past each additive) and the number

of additives is lower than the other samples, it presents a higher health risk due to the harmfulness of the additives present on the label, being mentioned possibility of negatively affecting the activity and attention of the children.

By adding the number of additives found in the three samples of dietetic ice cream, it stood at 27, an impressive number considering that ice cream is one of the food products to search in any season but especially during the hot season.

The sensorial analysis shows that all types of dietetic ice cream studied showed superior qualities without departing from the product standard.

In conclusion, the food additives present in the studied dietetic ice cream are chemical synthesis substances and, since they are not naturally found, should not be part of people's diet because they are not recognized and accepted by the body, abusive consumption and especially often having adverse effects on health.

Thus, the long-term consumption of synthetic dietary ice cream especially in the low age segment produces a bombardment on the internal organs in the human body, leading firstly to the destruction of the immune system so necessary for human health as well as the emergence of malignant and benign tumors.

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