

Evaluation of Nutritional Composition in Greek Yogurt Packaging Marketed in Brazil

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ABSTRACT: The study aimed to analyze the composition and different proportions of nutrients in Greek type yogurt sold in the metropolitan region of Recife. This type of fermented milk had recent insertion and rapid market acceptance and taste of Brazilians. As production so young, it does not have specific legislation, what motivate investigation and questioning of the quality of these products from the nutritional point of view. It was found that the products surveyed in major supermarkets in the Recife metropolitan region meet the yoghurt labeling rules laid down in the Resolution ANVISA RDC n°360/2003, and the Identity and Quality Standards (PIQ) to fermented milks, established by MAPA in Resolution n°5/2000.

Keywords: Greek yogurt, packaging, nutritional composition, protein.

I. INTRODUCTION

Yogurt is by definition a fermented beverage obtained with proto-symbiotic cultures of *Streptococcus salivarius* subsp. *Thermophilus* and *Lactobacillus delbrueckii* subsp. *Bulgaricus*, and may present other complementary acid-lactic bacteria [1]. It is a nutritional and functional product, consisting of rich source of protein, calcium, vitamins and carbohydrates, in addition to being easily associated with a positive image of healthy food. According to Ramos [2], concentrated yogurts can be categorized as intermediate products between traditional fermented milks and unprocessed high moisture cheeses, such as quark cheese, boursin and petit suisse.

The origin of concentrated yoghurt is in the Middle East and has different denominations according to the country or region that produces it: labneh (East), skyr (Iceland), shrikhand (India) and Greek (Greece). In the industrial production and wide dissemination in the market was the Greek company Fage that presented the product highlighting the denomination "Greek" in the United States in the 90s. The insertion in the Brazilian market happened in 2012 by the main brands of dairy products and moved to move the competitiveness of the yoghurt segment [2].

The original Greek yogurt from the Balkans is a handmade product obtained from the desorption, passing the fermented milk through a cloth bag. In industrial production, this type of yogurt can be obtained by physical processes of centrifugation or filtration with the use of membranes. After the desorption stage, a yoghurt of thick and creamy consistency is obtained, whose total solids concentration is approximately 24% and of fats, 10% [3].

The industrial production of Greek yoghurt as it is made in Greece requires expensive and long-lasting equipment and methods (Fig.1). Brazilian manufacturers commonly use different means to obtain the texture that will possibly be attractive to the consumer, such as adding thickening agents and increasing protein. Examples are: modified corn starch, pectin, gums, carrageenan, gelatin, skimmed milk powder, whey or caseinate whey concentrate which increase the consistency of the final product. In these cases, yogurts may be added with concentrated milk protein or not [4].

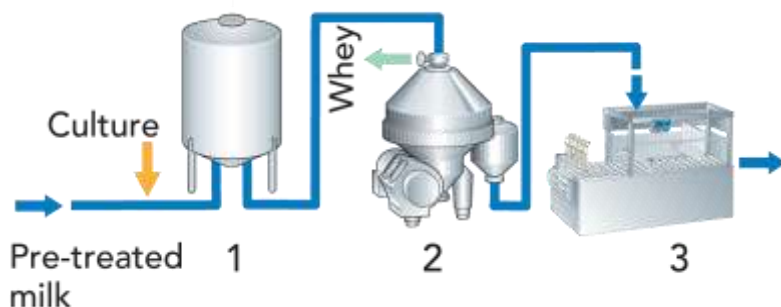


Fig.1: Greek or strained yoghurt production.

1) Incubation tank; 2) Separator or membrane filtration; 3) Cup filler.

There is still no specific legislation (Brazilian or American) that recommends method of production and composition of Greek type yogurts. The popularity of the product as it was launched and its recurring association with a supposed healthy diet calls for a more critical look that seeks to identify the presence of beneficial and truly nutritious components. In view of the above, the objective of this work was to analyze, from the labeling, the ingredients and contents of protein and fat of the Greek yoghurts marketed in markets of the Metropolitan Region of Recife in comparison with Resolution No. 5, which establishes the Identity and Quality Standards of Fermented Milks, and Resolution ANVISA RDC n°360 / 2003 that establishes nutritional labeling standards for foods that are not packaged in front of the consumer.

II. SUBJECTS AND METHODS

A survey of concentrated yoghurt of different types (added cream, whole, partially skimmed, skimmed) commercially denominated 'Greek yogurt' was carried out. The nutritional information and ingredients contained in the packaging labels of different brands available for commercialization in the metropolitan area of Recife were analyzed.

The information contained in the sample labels was compared. These were analyzed according to Resolution No. 5 [1], which recommends that yogurts should contain a minimum milk protein content of 2.9 g / 100 g and a milk fat content of 6 g / 100 g in added cream yoghurt, ranging from 3 to 5.9g / 100g in whole grains, from 0.6 to 2.9g / 100g in partially skimmed and up to 0.5g / 100g in skimmed yoghurts, and according to Resolution ANVISA RDC No. 360/2003, where nutrition labeling (Declaration of energy value, quantities of carbohydrates, proteins, total saturated fats, trans fats, dietary fiber and sodium) for "food products and beverages produced, marketed and packaged in the absence of the customer and ready to be offered to the consumer".

According to the Codex Alimentarius, a document prepared by the World Health Organization (WHO) and the Food and Agricultural Organization of the United Nations (FAO), protein and fat content in fermented milks and yogurts must comply with the limits indicated in Table I.

Table I: Limits established by FAO/WHO for protein and fat contents in fermented milks and yoghurts.

Composition	Yogurt	Fermented milk
Protein (%m/m)	Minimum 2,7%	Minimum 2,7%
Total fat (%m/m)	Less than 15%	Less than 10%

III. RESULTS

The research verified a diversity of 48 types of Greek yoghurts, independent of the presentation and the form, available in the gondolas of the main supermarkets of the metropolitan region of Recife. They are listed in Table 1, as references to each type of Greek yogurt, in the variations: whole, with cream, partially skimmed and skimmed.

Table I: Survey of Greek yogurts in the variations observed in supermarkets in Recife

Type of Greek yogurt	Quantity
Whole	26
Added with cream	10
Partially skimmed	7
Skimmed	5
Total	48

Among the verified products, 98% of the samples were in agreement with the RDC No. 360/2003, presenting tables of nutritional composition according to nutrient values per unit, as foreseen in the legislation.

There were 2% of the verified products, which did not present the table of nutritional composition in a way that is visible to the consumer, going against what is recommended because it is information of a mandatory nature and should be presented in contrast with the color of the packaging and Readable form. It was observed that 20,83% of the analyzed products titled Greek had added cream in their formulations, 18,75% were added with concentrated protein of milk, whereas 39,58% did not present variation in the list of ingredients when compared to the usual.

All the analyzed samples had protein levels higher than those specified in the legislation, according to Fig.1, whose concentrations varied between 3,2 and 6,0 g/100g.

Regarding the percentage of total fat, there was agreement with Resolution No. 5, since the values varied between 6,1 and 8,3 g/100g, in samples added with cream, 3,7 and 4,5 g/100g, In whole samples, between 1,9 and 2,2 g/100 g in partially skimmed and 0 g/100 g samples in samples of skimmed Greek yoghurt. In Fig.1 a comparison of the maximum protein contents contained in each type of Greek yogurt is performed.

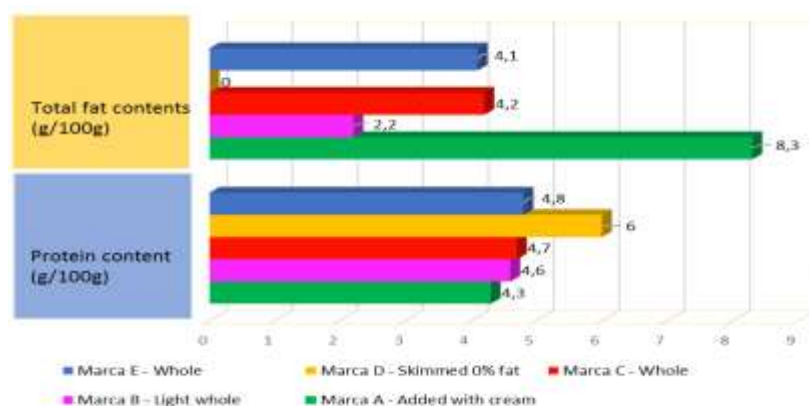


Fig.2: Protein and fat content per type of Greek yogurt.

It is observed that the yogurts, added and added with cream, have between 4.3 and 4.8 g / 100g of proteins, and do not differ significantly in this offer. The partially skimmed yogurts were at most 4.6g / 100g, only 11.6% higher than yogurts with cream and 4.2% lower than the portion present in whole yogurts. While skimmed yogurts have 6g / 100g, which corresponds to 41.7% more protein than whole yogurts.

All the samples of Greek yogurt, commercialized in supermarkets in the metropolitan area of Recife, were found to comply with Resolution No. 5, which is specific for identity and quality standards of fermented milks classified as cream, whole grain, semi-skimmed yoghurts Or skimmed, with no specificity for yoghurts known commercially as Greeks.

There is a correlation between the consumption of Greek yogurt and healthy life due mainly to the association of this product with high protein percentages, however these products differ little in relation to the ingredients and nutrients of the common yogurts found in the market. There is no specific legislation for Greek yoghurt in Brazil, allowing manufacturers to use methods of lower cost or greater convenience.

IV. CONCLUSIONS

The Greek-type yogurts marketed in Recife do not obey any specific existing standards, however, it is observed the care of the products researched for yoghurt labeling rules, is found in Resolution ANVISA RDC nº360 / 2003, and the Standards of Identity and Quality) For fermented milks, established by MAPA in Resolution No. 5/2000.

Because it is a product that makes easy use of the marketing of healthy foods and conquers consumers, it is interesting that they begin to consider the quality of the nutritional character with which companies sell their products, especially Greek yogurts.

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