EVALUATION OF THE ACCEPTABILITY, NUTRITION AND LABELLING CHARACTERISTICS OF DIFFERENT BRANDS OF YOGURT

Avaliação da aceitabilidade, características nutricionais e da rotulagem de diferentes marcas de iogurte

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SUMMARY

This study aimed to evaluate consumer opinions and preferences in relation for different brands of yogurts and their packaging and the adaptation of their labels to the labeling norms. Were evaluated four commercial brands of strawberry flavored yogurt (A, B, C and D) and their respective packaging, produced by dairy product plants in the area of Lavras-MG. Held the acceptance test, which was carried out in two sessions (evaluation of the packaging and the yogurts) and focus group sessions. The compliance of the labels from those brands to resolutions RDC nº. 259/2002, RDC nº. 359/2003 and RDC nº. 360/ 2003 were determinations made of protein, lipids, carbohydrates, fiber, calcium and sodium. The yogurt of brand D presented high acceptability, and the consumers liked its packaging as well as the product contained within it. The packaging and the yogurt of brand A was also well accepted by the consumers, but, as with yogurt brand D, presented irregularities in relation to the obligatory nutritional labeling norms. Most of the consumers liked the packaging of the yogurt brands B and C, however they did not like products contained within. The B and C brand yogurt labels were, also, in non-compliance with the norms of obligatory nutritional labeling. According to the participants of the three focus group sessions, the brand, the expiration date and the price are the most relevant factors at the time of a yogurt purchase.

Index Terms: Sensorial analysis; Focus group; Nutrition labeling.

1 INTRODUCTION

Yogurt, a kind of fermented milk with their identity and quality standards set by IN 46 (BRASIL, 2007), is a product that possesses excellent sensorial qualities, with high market diversification and good acceptability, due to its healthy and nutritious image (RAMOS et al., 2002) therefore,

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it is considered balanced and appropriate for any diet (TEIXEIRA et al., 2000, RODAS et al., 2001). For such benefits to be clear to the consumers, legislative measures, as in the case of food labeling regulations, are seen as important activities, including health promotion. The objective is to guarantee to the consumers, access to useful and reliable information, encouraging the commercialization of the healthiest products (YETLEY & RADEER, 1996).

Studies show a growing increase of the number of yogurt producers, especially of the strawberry flavor, in the South of Minas Gerais. However, some of those products present low market competitiveness, due to, among other factors, low quality standards, for the product as well as for their packaging and labels. Furthermore, they do not meet the labeling norms in effect.

The success of a company depends on product offer, and for such, they should satisfy the consumer needs and desires. According to KOTLER (2000), the starting point to know and to satisfy the needs of the target-client is to try to understand consumer behavior; to study how people, groups and organizations select, buy, use and discard products, services, ideas or experiences to satisfy their needs and desires.

Consumer behavior was investigated for several years, basically, through studies on sensorial acceptance or preference of the product (GUERRERO et al., 2000). However, more recently, the importance of observing which criteria the consumer adopts to choose, to buy and to consume certain products has been verified. It is in that context that the study of food packaging has become extremely important, since it represents the consumer's first contact with the product or the food. The package is the principal object for definition of choice and purchase (DELLA LÚCIA et al., 2007).

In this work, the objective was to evaluate the consumer opinions and preferences in relation to the yogurts and to their packaging, as well as the adaptation of their labels to labeling norms, seeking to propose improvements to increase the market competitiveness of those products.

2 MATERIAL AND METHODS

In this study, four commercial brands most commonly consumed in the region in 2010 coded with letters A, B, C and D of strawberry flavored yogurt produced by dairy plants in the region of Lavras – MG, and their respective packaging, were evaluated.

Acceptability of yogurts and their respective packaging

53 yogurt consumers were recruited, residents of the municipal district of Lavras – MG, through a recruitment questionnaire, in function of the habit of consuming yogurt at least once a month and of reading the yogurt labels frequently at the time of purchase.

The strawberry flavor yogurt of the four brands (A, B, C and D) and their packaging were sensorially evaluated, as to their acceptance. The structured nine point hedonic scale was used, the hedonic terms varying among "I extremely liked" (score equal to 9) and "I extremely disliked" (score equal to 1) (REIS & MINIM, 2006) to evaluate the acceptance of the packaging and the yogurts as to their global impression. The acceptance tests were carried out in individual cubicles with white light. The packaging and the yogurts were codified with three digit numbers and individually presented in two sessions, with an interval of two days between each. In the first session, the judges evaluated the packaging of the yogurt brands A, B, C and D and in the second session they evaluated the yogurts of those brands. The order of presentation of the packaging and the yogurts was according to the experimental layout obtained in Wakeling & Macfie (1995).

The results of the acceptance test were transformed in scores and tabulated on a double input table (consumer x sample) for each session. The paired sample t-test, at consumer level, was carried out to evaluate the significant difference ($P < 0.05$) among the acceptance scores obtained in each session, for each brand, as used by Lange et al. (1998). The hypothesis tested was that the average difference among the scores be equal to zero. In that way, the acceptance scores obtained in the first session were compared with those obtained in the second session, seeking to compare the expectation generated in the consumers by the packaging, with the performance of the respective products contained within them.

To facilitate the understanding of the results, frequency analysis of the hedonic scores obtained by the packaging and yogurts of each brand was done in agreement with the following acceptance ranges: scores from 6 to 9 (located among the hedonic terms "I extremely liked" and "I slightly liked"), score equal to 5 (hedonic term "indifferent") and scores from 1 to 4 (located among the hedonic terms "I slightly disliked" and "I extremely disliked").

The statistical analyses were carried out using the Sisvar 4.0 program procedures (FERREIRA, 2000).

Focus Group

The focus group sessions were planned and conducted according to stages described by Casey & Krueger (1994).

Twenty-four consumers, resident of the municipal district of Lavras – MG, were recruited through a recruitment questionnaire, employing the same criteria used for the recruitment of the acceptance test participants. The participants were divided into three groups of 8 people according to their schedules. Thereafter, three focus group sessions were conducted by a single moderator, in a comfortable room and with easy access, where the participants sat around a round table to allow for interaction, visual contact and harmony of the discussion. Each session lasted, approximately, one hour.

Each session began with questions about what they observed on the labels and yogurt packaging during the act of purchase. Soon afterwards, labeled packaging of strawberry yogurt of the brands A, B, C and D (Table 1) were randomly presented to the participants. These were introduced separately and, for each presentation, a previously elaborated list of questions was presented.

The focus group sessions were logged and recorded. From the logs and recordings the responses of the 24 participants, in respect to the packaging and labels of the evaluated yogurts, were obtained.

Verification of the accuracy of the obligatory nutritional labeling and compliance of the labels to the labeling norms

Physiochemical analyses of the strawberry flavored yogurts of the four commercial brands (A, B, C and D) were conducted. The determination of the protein, lipid, carbohydrate, fiber, calcium

Table 1 – Description of the packaging and labels of the yogurts presented in the focus group sessions.

Packaging/label	*Type of packaging*	*Description of label*
1 – Packaging of yogurt brand A	PET* bottle, pink color, one thousand gram capacity, and red screw cap	White label with illustration (design) of strawberries and a boy, and diagonal yellow stripes. The front panel contains the following information, written in red: Strawberry yogurt with fruit pulp, shake before drinking. Trademark in yellow and red. Keep refrigerated 1º to 10ºC and net content one thousand grams written in black.
2 – Packaging of yogurt brand B	PET* bottle, white color, one thousand gram capacity, and red screw cap.	Blue label with illustration (design) of strawberries and falling yogurt. The front panel contains the following information, written in blue: Yogurt with strawberry pulp, Brazilian industry, shake before drinking and SAC (consumer service center). Trademark in blue, red and green. Net weight one thousand grams written in white.
3 – Packaging of yogurt brand C	PET* bottle, white color, one kilogram capacity, and red screw cap.	Pink label with illustration (design) of strawberries. The front panel contains the following information, written in black: Yogurt with strawberry fruit pulp, Brazilian industry, net weight one kilogram. Trademark in red and white.
4 – Packaging of yogurt brand D	PET* bottle, white color, five hundred gram capacity, and red screw cap.	White label with illustration (design) of strawberries. The front panel contains the following information, written in blue: Yogurt sweetened with whole strawberry fruit pulp, Brazilian industry, net weight 600 grams. Trade mark in red and white.

* PET - Polyethylene terephthalate.

and sodium levels were determined according to Brazil (2006). All the results expressed are averages of 3 repetitions.

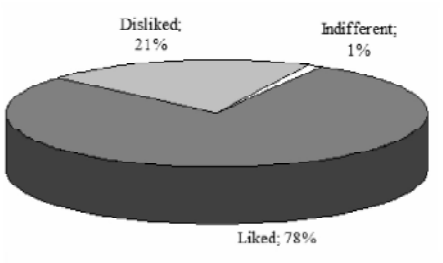
The results of those analyses were compared to the nutritional information cited on the labels of those yogurts, seeking to verify their accuracy and compliance to the RDC Resolution no. 360/2003 (technical regulation on nutritional labeling of packaged foods). The compliance of the yogurt labels of the A, B, C and D brands to the RDC Resolution no. 259/2002 (technical regulation on labeling of packaged foods) and to the RDC Resolution no. 359/2003 (technical regulation on portions of packaged foods for nutritional labeling ends) was also verified.

3 RESULTS AND DISCUSSION

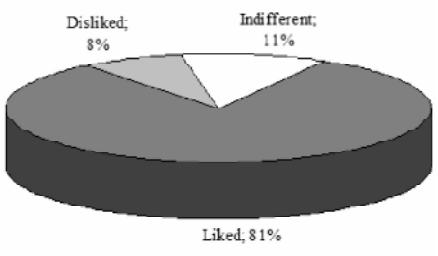
The paired sample t-test detected significant differences ($p < 0.02$) among the acceptance scores of the brands B and C obtained in the first (packaging evaluation) and second (yogurt evaluation) sessions, evidencing differences among the expectation generated in the consumers by the B and C packaging and the performance of the products contained within them. It is verified in Figure 1 that most of the consumers liked packaging B and C (81% and 74% respectively). Such a fact is of great relevance for the industries that produce the yogurt brands B and C, because it indicates that their investments in the design and/or marketing of the respective packaging presented satisfactory results, and according to Costa Santos & Castro (1998), the packaging positions the product to confront the competition, creates and reinforces the image and decisively contributes to profit increases. Therefore, the B and C yogurt brand packaging can represent the differentiation factor among the various yogurt brands, offering important competitive advantages (SERAGINI, 1995).



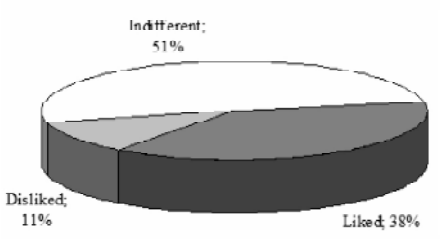
Brand A yogurt packaging



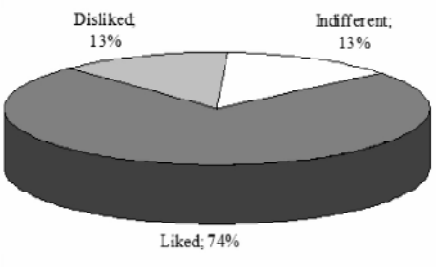
Brand A yogurt



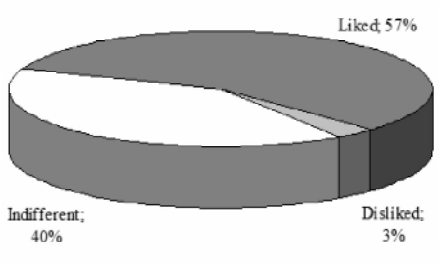
Brand B yogurt packaging



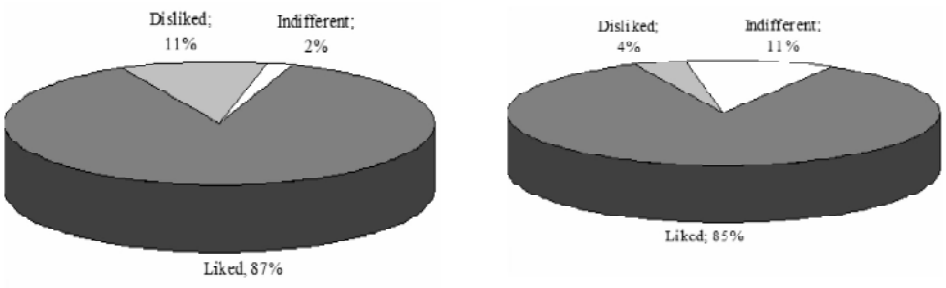
Brand B yogurt



Brand C yogurt packaging



Brand C yogurt



Brand D yogurt packaging Brand D yogurt

Figure 1 – Acceptance range frequency of the packaging and yogurts of brands A, B, C and D in the two sessions.

However, only 38% of the same consumers liked the product contained in packaging B (Figure 1) and 57% liked the product contained in the packaging C (Figure 1), a negative non-confirmation of expectation occurring. This fact suggests the need to improve the quality of the B and C brand yogurts, because, in spite of the consumer attraction to those packagings, the non confirmation of the expectation can lead to the rejection of the product at the next purchase (DELIZA & MACFIE, 1996).

In relation to the yogurts of brands A and D, there was no significant difference ($p>0.05$) among the acceptance scores obtained in the first and in the second session, indicating that the expectation generated by the packaging was confirmed in the sensorial evaluation of the product, in other words, a confirmation of the expectation occurred (DELIZA & MACFIE, 1996). It is observed in Figure 1 that more than 75% of the consumers liked the packaging as well as the yogurt of the brands A and D.

The focus group sessions revealed that price, brand, expiration date, packaging conservation and appearance, packaging and label design, net weight and nutritional information are the main factors that the participants observe at the time the yogurt purchase. However, as in study by Della Lúcia et al. (2007), the brand, the validity date and the price are the factors of higher relevance in the purchase process of the focus group participants.

For 84% of the focus group session participants the brand is a very important factor in the purchase process, because according to reports, it contributes quality, technology and credibility to the product. Therefore, it is fundamental that the yogurt producers elaborate marketing strategies to consolidate their brands in the market. This is because the dairy product sector represents an immense market potential and, consequently, high competition, which causes this sector to invest more and more in publicity to make those products more competitive (ISHIMOTO & NACIF, 2001). Studies carried out by Carneiro (2005) and Deliza (1996) also revealed that products of known brands are preferred by consumers.

It was verified that 76% of the focus group participants observe the yogurt expiration date at the time of purchase agreeing with studies conducted by Machado et al. (2006) to evaluate consumer behavior regarding the label reading of food products and by Della Lúcia et al. (2007) to study the importance of the packaging factors of ground, roasted organic coffee on consumer purchase intention.

In relation to the price, 72% of the participants said it to be one of the most important factors for the purchase of the yogurt. For them, if a brand unknown to them exists, but the price is low, they acquire the product with the intention of knowing the new brand. As such, the challenge of the company is to provide the consumer with a confirmation or a non-positive confirmation of their expectation, in other words, the consumer will approve the product after its consumption.

For the participants of the sessions, the strawberry yogurt label illustration should contain vibrant colors, succulent strawberries and that do not look artificial. In this study, 87% of the participants consider the illustration of the brand D yogurt label the most beautiful and attractive. This might have been important in the participant purchase intention evaluation, since this attractiveness of packaging of brand D might have been responsible for their high purchase intention, even not knowing the product. However, in relation to the yogurt packaging of the brands A, B and C, most of the participants (67%, 87% and 84%, respectively)

did not like their illustrations, a reformulation of the those label designs being necessary.

The Table 2 contains the caloric values and the nutrient contents declared on the yogurt labels of the brands A, B, C and D and the values found in the conducted physiochemical analyses.

It was verified that all the brands presented some irregularity in relation to the RDC Resolution no. 360/2003, which establishes a maximum tolerance of + 20% in relation to the nutrient values declared on food product labels.

The brand A was that which presented nutrient values closer to those obtained by the analyses, and only its calcium level was above the established 20% (Table 2). The other yogurt brands presented wide variation in relation to the saturated and total fat levels, reaching a variation of 65.7% for total fats in brand D which was also that with a higher disconformity in relation to the other parameters. Those irregularities can harm the success of those dairy products, mainly because currently, the media can influence the credibility of the brand through the popularization of analyses results highlighting the consumption risks of products which are in non-conformity with the legislation, offering health risks, besides keeping the consumers alert for possible alterations (MACHADO et al., 2006).

It was also verified, that all the appraised brands were in accordance with the specifications of the RDC Resolution no. 259/2002 and RDC Resolution no. 359/2003.

The results obtained in this research were similar to those obtained by Yoshhizawa et al. (2003). Those authors investigated the accuracy of 220 labels of foods of different categories and concluded that most of the manufacturers do not comply to the Brazilian legislation in effect, because all of the analyzed labels presented some irregularity.

4 CONCLUSIONS

According to the participants of the three focus group sessions, brand, expiration date and price are the items most relevant when buying a yoghurt. The strawberry yogurt brand D was the least attended to the limits set by the rules of mandatory nutrition labeling. But it proved to be the most accepted by consumers, followed by the

Table 2 – Values declared on the labels and those obtained by physiochemical analyses referring to the nutritional composition of the yogurts of brands A, B, C and D, and percentage of variation between these values.

	Yogurts			***Yogurts***		
	Brand A (Portion 200g)			*Brand B (Portion 200g)*		
Caloric value/ Nutrients	Value declared on label	Value obtained in analysis	% Variation	Value declared on label	Value obtained in analysis	% Variation
Energy value	178.0 kcal	167.18 kcal	6.1	190.0 kcal	164.5 kcal	13.42
Carbohydrates	28.0 g	26.7 g	4.8	28.0 g	25.8 g	7.9
Protein	5.7 g	5.1 g	10.5	6.0 g	5.6 g	7.3
Total Fat	4.8 g	4.5 g	7.1	6.0 g	4.3 g	27.7
Saturated Fat	3.0 g	2.8 g	6.3	4.0 g	2.7 g	31.8
Fiber	0.0 g	0.0 g	0.0	0.0 g	0.0 g	0
Calcium	240.0 mg	180.0 mg	25.0	not declared	-	-
Sodium	83.0 mg	81.2 mg	2.2	80.0 mg	83.4 mg	4.3
	Brand C (Portion 200g)			*Brand D (Portion 200g)*		
Energy value/ Nutrients	Value declared on label	Value obtained in analysis	% Variation	Value declared on label	Value obtained in analysis	% Variation
Caloric value	202.0 kcal	183.9 kcal	9.0	236.0 kcal	157.0 kcal	33.5
Carbohydrates	31.0 g	29.9 g	3.5	39.6 g	27.7 g	29.9
Protein	6.0 g	5.7 g	5.0	6.0 g	6.9 g	14.7
Total Fat	6.0 g	4.6 g	25.7	6.0 g	2.1 g	65.7
Saturated Fat	4.0 g	2.9 g	27.5	3.5 g	1.3 g	62.9
Fiber	0.0 g	0.0 g	0.0 g	0.0 g	0.0 g	0.0
Calcium	not declared	-	-	240.0 mg	200.0 mg	16.7
Sodium	120.0 mg	70.2 mg	41.5	120.0 mg	88.4 mg	26.3

brand, both in terms of sensory quality of yoghurt, as the characteristics of their containers and their labels. The information contained in the mandatory nutrition label strawberry yogurt brand A were those closest to the performed analysis. Already, in brands C and D, and are in disagreement regarding the RDC 360/2003, yoghurts and their packaging were not well accepted by consumers. The four brands of yogurt were in accordance with the specifications of the DRC and the DRC 259/2002 359/2003. However, all showed irregularities in relation to nutritional information on their labels according to the RDC 360/2003.

SUMÁRIO

Este estudo teve como objetivos avaliar as opiniões e as preferências dos consumidores em relação a diferentes marcas comerciais de iogurte e suas respectivas embalagens e a adequação dos seus rótulos às normas de rotulagem, visando propor melhorias para aumentar a competitividade desses produtos no mercado. Avaliaram-se quatro marcas comerciais de iogurte sabor morango, produzidas em laticínios da região de Lavras-MG (A, B, C e D) e suas respectivas embalagens. Realizou-se o teste de aceitação em duas sessões (avaliação das embalagens e dos produtos) e sessões de grupo de foco. Para avaliar a adequação dos rótulos dessas marcas às resoluções RDC nº 259/2002, RDC nº 359/2003 e RDC nº 360/2003 foram feitas determinações de proteína, lipídeos, carboidrato, fibra cálcio e sódio. O iogurte da marca D apresentou grande aceitabilidade, sendo que os consumidores gostaram tanto da sua embalagem quanto do produto contido na mesma. A embalagem e o iogurte da marca A também foram bem aceitos pelos consumidores, mas, assim como o iogurte da marca D, apresentou irregularidades em relação às normas de rotulagem nutricional obrigatória. A maioria dos consumidores gostou das embalagens dos iogurtes das marcas B e C, entretanto não gostaram dos produtos contidos nas mesmas. Os rótulos dos iogurtes das marcas B e C estavam, também, em desconformidade com as normas de rotulagem nutricional obrigatória. Segundo os participantes das três sessões de grupo de foco, a marca, a data de validade e o preço são os fatores de maior relevância na hora da compra de iogurte.

Termos para indexação: Análise sensorial; Grupo de foco; Rotulagem nutricional.

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