Consumers' perception of beef burgers with different healthy attributes

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ABSTRACT

Although the demand for healthy foods has increased, the desire for convenience prevails. Thus, there is an opportunity to popularize convenient yet healthy food. Despite efforts investigating the technical feasibility of achieving healthy attributes in meat products, few studies have addressed consumer perceptions regarding these products. Projective techniques have been used to better understand consumer attitudes towards foods and beverages. For these reasons, the objective of this study was to evaluate the suitability of the projective technique of word association to obtain inferences about consumer perceptions regarding four types of frozen burgers: traditional, reduced-sodium, reduced-fat and with antioxidants. The projective technique of word association was employed with cluster analysis based on an attitudinal questionnaire. Fifty-six consumers participated. Healthiness, Good Flavor, Quality/Flavor Apprehension and Fat/Calories were the most mentioned categories and therefore deserve the industry's attention. Different types of burgers revealed distinct associations, suggesting that marketing efforts could consider these particular attributes. Consumers with different attitudes towards health might have different perceptions of these meat products, which could be further explored. In general, all products considered in this study merit further investigation in quantitative and qualitative consumer studies, and the projective technique of word association deserves to be increasingly used.

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1. Introduction

The increase in consumer interest in healthy products has created a potential market for meat products with healthy attributes, such as those with reduced sodium or reduced fat (Resurreccion, 2004). Additionally, there is growing interest in the development of meat products with new health attributes (Decker & Park, 2010; Weiss, Gibis, Schuh, & Salminen, 2010), such as providing natural antioxidants (Karre, Lopez, & Getty, 2013; Zhang, Xiao, Samaraweera, Lee, & Ahn, 2010) or dietary fiber (Martínez, Miranda, Franco, Cepeda, & Vázquez, 2011).

Although this market is promising, it is important to understand consumers' perceptions of and attitudes toward new products to achieve appropriate product positioning (Carrillo, Varela, Salvador, & Fiszman, 2011; Furst, Connors, Bisogni, Sobal, & Falk, 1996). To better understand consumer choice, some authors have endorsed the use of indirect research methods. The evaluation of individuals'

behavior regarding food may provide insight into factors that influence consumer choices (Garber, Hyatt, & Starr, 2003).

In general, a favorable attitude towards a product can mean that the consumer has a greater propensity to purchase it. In this context, projective techniques can provide an understanding of consumers' thoughts and feelings (Steinman, 2009). This approach reveals the deep values and needs of individuals (van Kleef, van Trijp, & Luning, 2005).

Projective techniques have proven to be powerful tools for rapidly obtaining information and are sometimes used as an alternative to focus groups. Valuable insights can be obtained and, even when applied to a small sample size, may direct further studies that better represent the population. Word association is one such technique that has contributed relevant information about consumers' behavior (Ares, Barreiro, Deliza, Gimenez, & Gambaro, 2010; Ares & Deliza, 2010; Guerrero et al., 2010; Mitterer-Daltoé, Carrillo, Queiroz, Fiszman, & Varela, 2013; Piqueras-Fiszman, Velasco, Salgado-Montejo, & Spence, 2013; Vidal, Ares, & Giménez, 2013).

In general, projective techniques are still being incorporated into the sensory analysis of food products, and few studies performed in Brazil have been published in relevant journals. In this

regard, the aim of this study was to preliminarily evaluate the suitability of the projective technique of word association to obtain inferences about consumers' perceptions regarding frozen burgers with healthy attributes, preceding more in-depth research. More specifically, we sought to classify consumers according to their attitudes towards health and obtain insights on the perceptions of consumers towards different types of burgers (traditional, reduced-sodium, reduced-fat and with antioxidants).

2. Materials and methods

The study was divided in four main parts: (1) overview of the study and consumer sample; (2) description of the stimuli used; (3) task undertaken by consumers; and (4) data analysis.

2.1. Overview of the study and consumer sample

The study was conducted at a sensory evaluation laboratory located at a university in Brazil. Participants were invited by email and recruited from the university community. The intention was to gain insight into how consumers address different healthy attributes in burgers, so the sample was not planned to represent an actual market population but rather to provide valuable qualitative inferences. For this reason, the participants were eligible to complete the tasks only if they had eaten frozen food that was bought for home consumption in the previous three months or if they had eaten any type of burger, inside or outside the home, also in the previous three months.

Fifty-six people participated in the study, of whom 78.6% were females and 21.4% were males. Regarding socio-economic characteristics, 80.4% of the respondents were aged 18—25 years. Only six subjects were aged between 26 and 35 years, comprising 10.7% of the sample. There were five participants from 46 to 55 years old, representing 8.9% of the total. The level of education also did not display much variability. Most participants (60.7%) had incomplete higher education, 33.7% had complete higher education, and 5.4% had completed high school as the highest level of education. Table 1 summarizes information on the sample.

2.2. Description of the stimuli used

The stimuli used in this study were images of frozen burgers with different information regarding the product. The frozen

burger is widely known and consumed in Brazil and worldwide. The types of frozen burgers considered in this study were: traditional (stimulus A), reduced-sodium (stimulus B), reduced-fat (stimulus C), and with antioxidants (stimulus D).

In total, four sets of four cards were used as stimuli, each card with identical images of a frozen burger but with different specifications regarding the type of burger and also with different encodings. The cards were printed with colored ink and wrapped with self-adhesive paper. The stimuli used are shown in Fig. 1.

2.3. Task undertaken by consumers

The participants were instructed and directed to individual booths in the sensory analysis laboratory to perform the task, where the stimuli were already positioned. The researchers paid attention to the randomization of the cards (stimuli), which was previously established and guaranteed.

Each consumer received a questionnaire with instructions and answer spaces. The cards with the types of burgers were evaluated from left to right by responding to each one with associations, thoughts or feelings that came to mind on the questionnaire. Then, the consumers were asked to indicate the degree of agreement with respect to a series of statements that comprised the attitudinal questionnaire. The statements were selected and adapted from two studies that aimed to identify consumer perceptions of food with healthy attributes (Ares, Giménez, & Gámbaro, 2008; Menezes, Deliza, Chan, & Guinard, 2011). These mentioned studies used attitudinal questionnaires regarding health and nutrition, food neophobia and functional products.

The consumers were asked to mark the degree of agreement with each of the 10 statements on a nine-point scale, ranging from one (strongly disagree) to nine (strongly agree). These responses would form the basis for identification of different groups of consumers considering their attitudes. Table 2 shows the sentences that composed the attitudinal questionnaire and the topics addressed in each sentence (these divisions were not presented to the participants).

2.4. Data analysis

2.4.1. Cluster analysis
After tabulating and coding the data, a cluster analysis was performed. The hierarchical clustering was conducted to identify possible groups of consumers with internally similar behavior and externally different behavior based on the attitudinal questionnaire. A hierarchical cluster analysis was performed using Ward's method and applying the squared Euclidean Distance as the distance or similarity measure. In this method, which is the most commonly used, cluster members are obtained by calculating the total sum of squared deviations from the mean of a cluster. The analysis was performed in the XLSTAT 2013 program.

2.4.2. Word association
The word association test was analyzed in a qualitative way as a projective technique. All associations provided by the participants were considered, and the analysis began by searching for the most recurrent terms.

For each stimulus (type of burger) shown to the consumers, the participant was asked to provide four words or terms. By transcribing the data collected, 547 associations were identified.

The categorization was performed so that terms with similar meanings were grouped in the same category. A category was considered for further analysis if its terms were cited by more than

Table 1
Socio-economic characteristics of the sample.

n	Cluster 1	Cluster 2	Cluster 3	χ^2
Age				6.5
18—25 years	66.70%	100.00%	84.20%	
26—35 years	16.70%	0.00%	10.50%	
36—45 years	16.70%	0.00%	5.30%	
Sex				6.7
Female	83.30%	61.50%	84.20%	
Male	16.70%	38.50%	15.80%	
Education				11.9[a]
High school	4.20%	15.40%	0.00%	
Incomplete Graduation	45.80%	84.60%	63.20%	
Graduation	50.00%	0.00%	36.80%	
Income group (monthly minimum wages)				9.2
1	0.00%	7.70%	5.30%	
2—3	20.80%	7.70%	26.30%	
4—5	25.00%	30.80%	21.10%	
6—10	33.30%	23.10%	36.80%	
11—15	16.70%	23.10%	10.50%	
Over 15	4.20%	0.00%	0.00%	
Uninformed	0.00%	7.70%	0.00%	

[a] There is difference at the 5% significance level.