



Assessing consumer expectations about pizza: A study on celiac and non-celiac individuals using the word association technique



I. Pontual^a, G.V. Amaral^b, E.A. Esmerino^c, T.C. Pimentel^d, M.Q. Freitas^c, R.K. Fukuda^e, I.L. Sant'Ana^e, L.G. Silva^{a,f}, A.G. Cruz^{a,f,*}

^a Instituto Federal de Educação, Ciência e Tecnologia do Rio de Janeiro (IFRJ), Mestrado Profissional em Ciência e Tecnologia de Alimentos (PGCTA), Maracanã, 20270-021 Rio de Janeiro, Brazil

^b Universidade Federal Rural do Rio de Janeiro (UFRRJ), Departamento de Tecnologia de Alimentos (DTA), 23890-000 Seropédica, Rio de Janeiro, Brazil

^c Universidade Federal Fluminense (UFF), Faculdade de Medicina Veterinária, 24230-340 Niterói, Rio de Janeiro, Brazil

^d Instituto Federal do Paraná (IFPR), Paranavá 87703-536, Paraná, Brazil

^e Instituto Federal de Educação, Ciência e Tecnologia do Rio de Janeiro (IFRJ), Departamento de Matemática e Estatística, Maracanã, 20270-021 Rio de Janeiro, Brazil

^f Instituto Federal de Educação, Ciência e Tecnologia do Rio de Janeiro (IFRJ), Departamento de Alimentos, Maracanã, 20270-021 Rio de Janeiro, Brazil

ARTICLE INFO

Article history:

Received 10 October 2016

Received in revised form 21 January 2017

Accepted 24 January 2017

Available online 25 January 2017

Keywords:

Word association

Consumers

Pizza

ABSTRACT

The word association (WA) technique was used to investigate the perception of two groups of consumers (72 celiac and 78 non-celiac individuals; 150 in total) to pizza dough (thick or thin) and the raw material used at the manufacture (cassava flour or rice flour). Different perceptions of the four stimuli were detected by Chi-square test ($X^2 = 314.393$, $p < 0.0001$) for both groups. Seven categories were used for both groups: food/composition, health, doubt/uncertainty, novelty, negative feelings, positive feelings, and sensory aspects. The stimulus 'pizza dough made with cassava flour' was associated with the category "food/composition" and the stimuli 'pizza made with rice flour', 'pizza made with cassava flour' and 'thin dough' were associated with "positive feelings". The stimulus 'thick dough' was related only to the category "negative feelings". WA indicated that gluten-free pizza should have thin dough and us cassava flour or rice flour as the raw material.

© 2017 Elsevier Ltd. All rights reserved.

1. Introduction

Disorders related to gluten consumption have been widely reported in the literature, and among these disorders, celiac disease (CD) is the most frequently studied (Eli et al., 2015). Celiac disease is a genetic autoimmune disorder in which predisposed individuals are intolerant to gluten. To date, the only treatment consists of eliminating gluten products from the diet, including all food products containing wheat, barley, rye, malt, oats and products derived from them (Ludvigsson & Green, 2011; Fasano et al., 2008).

The limited availability of gluten-free products coupled with high prices may jeopardize compliance with the treatment by celiac patients, thus compromising their economic, social, and psychological well-being and leading to clinical and nutritional complications (Lee, Ng, Diamond, Ciaccio, & Green, 2012).

The increased supply and availability of gluten-free products in the marketplace is critical for providing nutritious food with and sensory appeal for both celiac individuals and consumers who want to avoid the consumption of gluten-containing products (Zandonadi, 2006). Therefore, studies with celiac and non-celiac individuals are important

for evaluating the differences between groups and developing products that appeal to both categories.

To understand the consumers' behaviour and motivation, qualitative research has been used in food science. Projective techniques are based on the principle of spontaneous and subjective tendencies, which are motivated by implicit needs and are used in various studies about food consumption and commercialization (Jervis & Drake, 2014). The results of previous research have not provided a 'right or 'wrong' response as consumers project their unconscious feelings and opinions about the product they were evaluating (Donoghue, 2000).

Among the qualitative methods used to investigate consumers' perceptions, the word association (WA) technique has been shown to be quite useful. In this technique, visual or verbal stimuli are presented to consumers, who should use the first words or phrases that are associated with these stimuli (Gámbaro, Parente, Roascio, & Boinbaser, 2014; Andrade, Sobral, Ares, & Deliza, 2016). The generated words/phrases are quite relevant for understanding why and how consumers make their choices, thereby contributing to an effective exploitation of their choices and perceptions (Eldesouky, Pulido, & Mesias, 2015).

WA has been used to obtain consumers' perception of several food products, including yogurts (Ares, Gimenez, & Gámbaro, 2008), dairy desserts (Ares & Deliza, 2010), milk chocolate desserts (Ares, Barreiro, Deliza, Gimenez, & Gámbaro, 2010), vegetable oils (Gámbaro, Dauber,

* Corresponding author.

E-mail address: food@globo.com (A.G. Cruz).

Ares, & Ellis, 2010), chocolate (Gámbaro & Ellis, 2012), ice creams (Silva et al., 2014), frozen hamburgers (Viana, Silva, & Trindade, 2014), and lamb meat (Andrade et al., 2016). Although WA has been widely used in the last several years, its use for comparing the perceptions of two distinct populations is uncommon. Varela et al. (2014) used WA to investigate the perception of an apple beverage made with a newly developed excelsior *Fraxinus* seed using two distinct populations (diabetic and healthy individuals). No difference was found between the groups, and both populations perceived the beverage as a functional product. Although several authors have studied gluten-free products with celiac and non-celiac consumers (Laureati, Giussani, & Pagliarini, 2012; Giménez et al., 2015), no studies about pizza using projective techniques, such as WA, have been found in the literature.

The present study investigated the perception of pizza by two groups of consumers, celiac and non-celiac individuals, using the Word Association technique. Two aspects related to pizza manufacturing were considered: raw material and dough thickness.

2. Material and methods

2.1. The stimulus

Pizza is one of the most frequently purchased frozen food products in Brazil due to its low price, sensory properties, and convenience. According to a survey performed by the Brazilian Association of Celiac Individuals (ACALBRA) in 2004, pizza was cited as one of the foods that celiac individuals would like to find more easily in the marketplace, which reinforces interest in its industrialization and commercialization. Such results are in agreement with a survey performed by the Brazilian Institute of Geography and Statistics (IBGE, 2014), which showed that 36% of Brazilians eat pizza when dining out.

The commercially available gluten-free pizzas in Brazil are made with several ingredients, with cassava flour and rice flour the most commonly used raw materials. Rice flour is increasingly popular and is considered the most suitable cereal grain flour for the production of gluten-free products due to its bland taste, white colour, digestibility, and hypoallergenic properties (Torbica, Hadnadev, & Hadnadev, 2012). Cassava flour is one of the major products from cassava roots traded on the world food market (Ogunjobi & Ogunwolu, 2010). Brazil is one of the largest producers of cassava, with an estimated annual production of 23 million tonnes (IBGE/LSPA, 2016), and cassava is a promising alternative for use in gluten-free products. Pizza is normally consumed with a thin or thick crust. Although the amount of dough used is the main factor affecting crust thickness, the rising of the dough also plays an important role (Goto & Bianco-Simeral, 2011).

2.2. Word association task

The study was conducted in the city of Rio de Janeiro, Brazil, between November 2014 and February 2015. An online questionnaire was developed on Google+ (2014) (<https://docs.google.com/forms>) and sent by e-mail to celiac individuals, members of the 'Gluten-free Rio' group (www.riosemgluten.com.br) and ACELBRA (2014)-the Brazilian Association of Celiac Individuals (www.ancelbra.org.br). Non-celiac individuals were recruited randomly at the Federal Institute of Rio de Janeiro and included consumers who eat pizza at least once a week. The questionnaire was divided into two parts: the first part consisted of personal and socio-economic questions (age and salary/income), while the second part consisted of four cartoons containing the stimulus (pizza manufactured with cassava flour, pizza manufactured with rice flour, thin pizza dough, and thick pizza dough; see Fig. 1). Consumers evaluated one stimulus at a time and were asked to write the first associations, thoughts or feelings that came to their minds when observing the images. There was no limit to the number of words or terms a participant could use in response to each stimulus. The cards were presented monadically in a balanced random order.

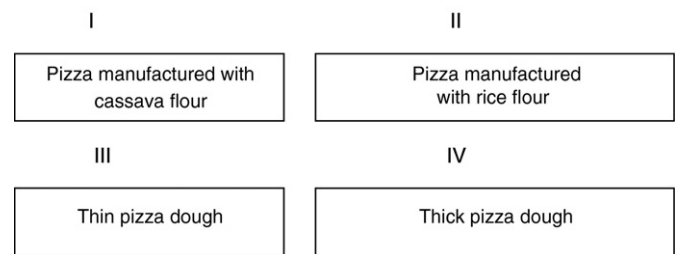


Fig. 1. Stimuli offered to participants at the word association task.

2.3. Data analysis

The data were analysed in accordance with previous studies (Gámbaro et al., 2014; Guerrero et al., 2010; Modell, 2005; & Wadsworth, 2000). The recurrent terms cited by the respondents were grouped into seven categories. Initially, the grouping of the terms was performed individually by each of the three members of the research team (triangulation technique), i.e., three different researchers independently grouped the terms into the categories. Then, the results generated individually by the three researchers were discussed in subsequent meetings to reach a consensus. The grouping of terms in each category was determined by counting similar words or phrases deemed synonymous to describe each stimulus. Only the terms mentioned by >10% of the participants were considered. The existence of significant differences between the numbers of words elicited per category for both groups was analysed by Chi-square test (Silva et al., 2014).

Correspondence analysis (CA) was used to obtain two-dimensional maps to observe the relationship between the generated stimuli and their categories listed by the respondents, separately for each group: celiac and non-celiac individuals (Greenacre & Fargas, 2010). This is a descriptive/exploratory technique designed to examine contingency tables with two entries containing correspondence measures between the rows and columns. The variables are projected in the factor-plane, providing a visual and simultaneous representation of all data (Santos et al., 2015).

Multiple Factor Analysis (MFA, Cruz et al., 2013) was used to verify the agreement of the two consumer groups in response to different stimuli. In addition, the regression vector coefficient (Rv) was used to measure the correlation between the two groups in the consensus spaces derived from CA. Regression vector coefficient (Rv) values fall between 0 and 1, and the closer the Rv value is to 1, the greater the similarity between the two configurations (Santos et al., 2015). All statistical analyses were performed using XLSTAT for Windows, version 2015.5 (Adinsoft, Paris, France).

3. Results and discussion

One hundred and fifty consumers participated in the survey: 72 celiac and 78 non-celiac individuals. The consumer study can be regarded as a convenience sample, which is usually used in exploratory studies when the main purpose is to obtain an approximation to a research study (Ares & Deliza, 2010; Varela et al., 2014). Of the male consumers, 61% were celiac and 39% were non-celiac individuals, while 50% of the female consumers were celiac individuals. The vast majority (74.7%) consumed pizza on a regular basis, while 22.7% stated they do not eat pizza because they have celiac disease and are afraid to consume products that contain gluten. Among the non-celiac consumers, 73% were 18–35 years of age, while 85% of the celiac individuals were 26–55 years of age. More than half of each group had attained a higher education (80% celiac versus 55% non-celiac individuals). A total of 74% of the respondents (40% non-celiac and 30% celiac individuals) reported a gross income between 6 and 10 minimum salaries.

Download English Version:

<https://daneshyari.com/en/article/5768278>

Download Persian Version:

<https://daneshyari.com/article/5768278>

[Daneshyari.com](https://daneshyari.com)