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How do Brazilian consumers perceive a non-traditional and innovative fruit juice? An approach looking at the packaging

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ABSTRACT

Consumer interest in nutritious and innovative foods encourages the development of products based on raw materials with nutraceutical potential. The health benefits provided by pomegranate have been recognized; therefore, the development of pomegranate juice may match consumer expectations regarding this goal. However, the concept has to first be accepted by the consumer. The aim of the study was to utilize a rating based conjoint analysis to investigate how Brazilian consumers perceive pomegranate juice by identifying the role of packaging attributes relevant to the consumer's intention to purchase. Five factors were considered in the study: technology used in the juice production (high hydrostatic pressure – HHP – a technology that preserves nutritional and sensory properties), antioxidants, price, preservatives, and colorant. Eight hypothetical pomegranate juice packages were created following an incomplete block design and evaluated by 150 fruit juice consumers. Three clusters were identified. The average results revealed that antioxidants were the attribute of greatest relative importance to cluster 1 (RI: 36%), followed by HHP (RI: 25%) and colorants (14%). Consumers in cluster 2 considered price as the most important attribute (RI: 41%), followed by antioxidants (RI: 21%) and HHP (RI: 18%). Cluster 3, as well as cluster 2, considered price the most important attribute (RI: 28%), followed by antioxidants (RI: 26%) and HHP (RI: 22%). The results showed that consumers valued information on the health benefits of antioxidants as well as on the technology, suggesting that both types of information may be relevant tools to increase the intention to purchase the product. The application of HHP for pomegranate juice processing was positively perceived by consumers, suggesting a potential commercial application in the Brazilian industry.

1. Introduction

Pomegranate (*Punica granatum* L.) is an ancient fruit with extensive global commercial appeal due to the increased demand for fresh and processed fruits with functional and nutraceutical properties (Ferrari, Maresca, & Cicarone, 2010). Pomegranate is consumed in several countries as a fresh fruit and in juices, alcoholic beverages and jellies, among other preparations, and is known to contain anti-inflammatory, antimicrobial and antioxidant properties due to the presence of phenolic compounds, such as hydrolysable tannins, ellagic acid and anthocyanins, which are responsible for the reddish color of the pulp (Al-Maiman,, & Ahmad, 2002; Ferrari et al., 2010; Gil, Tomas-Barberan, Hess-Pierce, Holcroft, & Kader, 2000; Viuda-Martos, Fernandez-Lopez, & Perez-Alvarez, 2010; Wetzstein, Zhang, Ravid, & Wetzstein, 2011).

The constant change in consumer lifestyle and eating habits over the years has led to increased consumption of processed products, leading to changes in the food industry as a consequence of consumer demand and interest to purchase processed foods combining both convenience and health. Consumers seek processed foods with fewer or no additives, low fat and/or sugar and similar characteristics of non-processed foods while preserving their nutritional and sensory properties (Deliza, Rosenthal, Abadio, Silva, & Castillo, 2005; Laboissiere et al., 2007; Mujica-Paz, Valdez-Fragoso, Tonello Samson, Welti-Chanes, & Torres, 2011). Despite the nutritional value (Al-Muammar & Khan, 2012; Aviram et al., 2000; Ross, Selvasubramanian, & Jayasundar, 2001; Sumner et al., 2005) and its consumption worldwide, pomegranate is not popular in Brazil, and it has only recently been used in fruit juice blends, and as an ingredient in formulated foods. Its production is very low compared to the other fruits, mainly the tropical such as passion fruit, mango, pineapple and guava, which are used to process the highly consumed ready to drink juices and nectars. According to the IBRAF (2013) the consumption of beverages made from fruits reached 1.152.670.000 l in 2012 and presented a growth of 8.1% compared to the year before. In addition, many consumers are concerned about environmental issues, and they look for products that use clean technologies that are able to reduce environmental impacts.

In order to service this specific market niche, the food industry has used innovative technologies such as high hydrostatic pressure (HHP),

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a non-thermal technology that applies pressures up to 1000 MPa for a certain time to inactivate pathogens/spoilage microorganisms, leading to an increased product shelf life that simultaneously preserves sensory attributes and reduces the destruction of components such as vitamins (Hendrickx, Ludikhuyze, Van den Broeck, & Weemaes, 1998; Norton & Sun, 2008).

Despite novel technologies that are able to ensure microbiological safety and improve the sensory aspects of the processed product, it is necessary to investigate how consumers perceive this new technology and their intention to purchase the food (Cardello, 2003) processed with such novel technologies. Therefore, investigating how pomegranate juice processed by HHP is perceived by Brazilian consumers combines two innovations: the technology and the fruit. An industry alternative to letting the novel food attract the consumer is to advertise the superiority of the technology and to correctly prospect it as a marketing strategy, i.e., using the packaging to communicate with consumers (Sorenson & Henchion, 2011). The packaging is the first contact between the product and the consumer and has a great influence on consumer intention to purchase. It also protects the food, identifies the product through its commercial brand, and can provide information that may increase or decrease consumer product expectation even before it is experienced (Ares, Besio, Gimenez, & Deliza, 2010; Carrillo, Fiszman, Lähteenmäki, & Varela, 2014; Carrillo, Varela, & Fiszman, 2012; Ferrarezi, dos Santos, & Monteiro, 2013).

The information provided on the package can be verbal (such as a claim) or nonverbal (pictures and symbols). All elements on the package must have the function of making the product attractive and work as a bridge between the product and the consumer by conveying feelings and communicating emotions (Cardello, 1995; Carrillo et al., 2014; Gadioli et al., 2013).

According to some authors, when the consumer has difficulty choosing a product among several options, she/he can use any specific information contained on the package, label or even from advertising to decide which product to purchase (Ares, Gimenez, Bruzzone, Vidal, & Maiche, 2013; Bredahl, 2004; Imm, Lee, & Lee, 2012; Mueller, Lockshin, Saltman, & Blanford, 2010).

Numerous studies related to packaging have been conducted to investigate the consumer intention to purchase and/or prefer, especially in foods with nutritional or health claims, through conjoint analysis (Annunziata & Vecchio, 2013; Ares et al., 2010; Dean et al., 2012; Hailu, Boecker, Henson, & Cranfield, 2009; Mesías, Federico Martínez-Carrasco, Martínez, & Gaspar, 2011). This method is widely applied to investigate the effects of packaging attributes on consumer choice, selection or intention to purchase through combinations of packaging attributes and levels (Deliza et al., 2005; Funrouls et al., 2011; Green & Rao, 1971; Moskowitz & Silcher, 2006).

Conjoint analysis (CA) addresses complex decision-making, or the process of assessment, comparison, and/or evaluation in which consumers decide which aspects of products or services are important. Consumers integrate information about different determinant attributes to form overall impressions of products (Louviere, 1988). The main principle of CA is that purchasing behavior can be interpreted as a choice among different products that have a set of differentiating attributes or characteristics. This study aimed at investigating the effects of packaging attributes on consumer intention to purchase pomegranate juice. This focus brings an important contribution to the fruit juice industry, as it may provide information on what consumers are willing to pay for a specific attribute (e.g., health benefits) or what they may give up to keep an attribute of particular importance.

2. Material and methods

2.1. Participants

One hundred fifty individuals participated in the study. The recruitment criteria included individuals aged from 18 to 70 years old, who consumed fruit juices, and were responsible for the household food purchases. The participants included lecturers, employees, and students of the Federal Rural University of Rio de Janeiro, Seropédica — RJ, Brazil. Participant profiles are shown in Table 1. It is possible to observe that the predominant gender of consumers was female, corresponding to 72% of the total of participants; males made up 28% of the total consumers. Despite the higher number of women, according to the IDEC (Brazilian Institute of Consumer Protection), this figure followed the tendency towards the role of women and household purchases, i.e., women decide food purchases in Brazil (IDEC, 2012). In addition, we may suggest that females were more interested in taking part in the study, as they promptly accepted the invitation. Grunert, Wills, & Fernándes-Celemín (2010) also reported a prevalence of women in their sample, which corresponds to the fact that women still have the main responsibility for shopping of food in most of the UK households. Participants in the present study were mostly young people aged from 18 to 25 years old (79.3%), as a consequence of the data having been collected at the University. The highest education level was graduate degree (74%). The predominant income was 1–5 the Brazilian minimum wage (49.3%), and the highest frequency of processed juice consumption was "once in a while" (38.6%), followed by "often" (36.6%). The data were collected in January 2014.

2.2. Conjoint analysis (CA)

CA was performed to investigate the influence of information on the technology used for the juice processing (HHP), health aspects (antioxidants, colorants and preservatives), and price on consumer intention to purchase a non-familiar fruit juice — pomegranate juice. CA is a technique that can be used to investigate the attributes that are important in the construction of consumer product preference and intention to purchase. The first step in the study design is to identify the appropriate attributes and specify their feasible levels. The attributes were defined based on previous studies from the literature, which emphasized the importance of delivering to the consumer nutritious products that closely resemble their non-processed counterparts (Deliza et al., 2005;

Table 1
Participants' (n = 150) socio-demographic profile, expressed in %.

Gender	
Female	72
Male	28
Age group (years)	
18–25	79.3
26–35	13.3
36–45	1.3
46–55	3.3
56–65	2.6
Education	
No formal education	1.3
Incomplete fundamental school	4
High school	0.6
Incomplete graduate	16
Graduate degree	74
Post-graduate degree	4
Income minimum Brazilian wage (MBW)[a] = R$724.00	
1 to 5 MBW	49.3
>5 to 10 MBW	23.3
>10 to 20 MBW	22.6
>20 to 30 MBW	2.6
>30 MBW	1.3
Consumption of processed juice	
Never	0
Rarely	14
Once in a while	38.6
Often	36.6
Daily	10.6

[a] In Brazilian currency (Real).