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New insights into perceptions of technology claims in greek-style yogurt: A view in the COVID-19 pandemic

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ABSTRACT

The Covid-19 pandemic has strongly impacted people's lives and the food industry. In this sense, food products claiming nutritional and health-promoting benefits due to the presence of bioactive peptides and probiotics, such as Greek-style yogurt, have been in demand. The objective of this work was to investigate, through word association, the perception of the consumers regarding the seven concepts related to Greek-style yogurt (traditional, ultra-creamy, zero fat, high content proteins, zero lactose, light and with no added sugars), in the context of social isolation due to Covid-19. In this online survey, 346 participants completed a questionnaire. The participants were divided according to health concerns (increased, not changed, or decreased) and eating habits (improved, not changed, or worsened) during the Covid-19 pandemic. Chi-square and prototypical analysis were used as statistical tests. During the Covid-19 pandemic, based on self-report, around 66% of the participants had their eating habits and their concerns about health changed. The general associations were related to the categories pleasure, health, creamy, pleasant texture, food restriction, and loss of sensory quality. 'Health' and 'pleasure' were negatively associated with the conceptualization of Greek-style yogurt. For the zero-fat, light, and sugar-free Greek-style yogurts, the terms creamy and ultra-creamy are sensory appealing to the consumers. In general, the price and concerns about health are factors that strongly influence the purchase intention of Greek-style yogurts. The yogurts were associated with sensory and non-sensory characteristics, which can be useful for marketing strategies for of different product concepts.

1. Introduction

The COVID-19 disease, caused by the virus SARS-CoV-2, has spread rapidly since first reported in Wuhan, China, and its surge was declared a pandemic by the World Health Organization (WHO) in March 2020 (Zhu et al., 2020; Youssef et al., 2021). Since then, measures were taken in almost all countries, such as closing borders and social isolation. These restrictions have affected various aspects of human life and strongly affected the global patterns of food consumption, production and supply (Eftimov et al., 2020). It is noticeable that the consumers have changed their point of view related to healthy habits and food consumption, e.g., preference for sustainable, healthy, organic, and functional foods, with the aim to improve their immune system during the Covid-19 pandemic (Askew, 2020a, 2020b; Galanakis, 2021).

Dairy food products are often associated with health benefits due to

their high nutritional values, e.g., protein and vitamin content. For example, yogurts, a fermented dairy product, are considered nutritious due to the presence of bioactive peptides and probiotics that may present health benefits to the human body, which may be interesting in the context of the Covid-19 pandemic. The peptides present in the yogurt are responsible for the angiotensin-converting enzyme inhibitory, bradykinin potentiating, antiviral, anti-inflammatory, antithrombotic and antioxidant effects (Gouda et al., 2021). In addition, the yogurt is an excellent source of calcium, phosphorus, riboflavin, thiamine, vitamin B12, folate, niacin, magnesium and zinc (Adolfsson et al., 2004; Hutkins, 2006; Fisberg & Machado, 2015; Glanville et al., 2015).

Concentrated yogurts are the fastest growing product category in the dairy industry and they are denominated according to their origins, such as labneh (East), skyr (Iceland), and Greek yogurt (Uduwerella et al., 2018; Gyawali et al., 2022). Greek-style yogurt or strained yogurt, is rich

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in proteins and fat, which positively affects the texture and creaminess when compared to traditional yogurt (Uduwarella et al., 2018). Sensory and texture attributes, such as creaminess, viscosity, and smoothness are important properties for the acceptance of this product by consumers (Desai et al., 2013).

Consumers' food choice is a relatively complex phenomenon affected by several factors. In this sense, the consumers' perceptions towards food products is an important tool for industries to become more competitive (Pohjanheimo & Sandell, 2009). The food companies are increasingly development and advertising new products based on consumers' perception (Faye et al., 2006; Van Trijp et al., 2007). Considering this fact, the understanding of how consumers describe the sensory characteristics of food products can be an important information (Ares et al., 2010).

However, the Covid-19 pandemic negatively affected the information collection regarding consumers' preferences and perceptions of food products (Rowan and Laffey, 2020). In this context, projective techniques, such as word association, can be used as an alternative to investigate consumers' perceptions (Eldesouky et al., 2015; Latorres et al., 2016; Pontual et al., 2017). The word association consists of providing visual or verbal stimuli to the consumer and requesting a description associated with these stimuli through words or phrases that are instantaneously associated with it, making it possible to understand how consumers make their choices and decisions related to the purchase of products (Esmerino et al., 2017).

Establishing correlations between consumers' perceptions and preferences is important to developing products by providing valuable information regarding the consumers' expectations (García-Gómez et al., 2019). Studies have already been carried out regarding the rheological, microbiological, compositional properties, and processing parameters of Greek-style yogurts (Ozer et al., 1999; Abu-Jdayil et al., 2002). However, few studies have been carried out regarding the sensory properties or consumers' perceptions of Greek yogurt (Desai et al., 2013; Moore et al., 2018).

Therefore, the aim of this study was to evaluate the perceptions and expectations of consumers regarding the different varieties of Greek-style yogurt (traditional, ultra-creamy, zero fat, high protein, zero lactose, light, and no added sugars), and also the impact of social isolation, caused by the COVID-19 pandemic, on the health perception and eating habits of Brazilians participants. The word association methodology was used in order to reinforce the study of this food with the qualitative depth provided by this technique. Specifically, we explored the following research questions (RQ):

1. Does sensory information or health claims on labels affect consumers' perception of Greek-style yogurt?
2. What are the main factors that impact the purchase and consumption of Greek-style yogurt?
3. Are people more concerned about their health and have they changed their eating habits during the pandemic?
4. Do perceived changes in health concerns and eating habits vary by gender, age group, marital status, education level and income?

2. Material and methods

2.1. Questionnaire

In the first part of the questionnaire, the consumers' perception of Greek-style yogurt concepts was evaluated through word association. Recently, online surveys have also adopted this methodology (Popoola et al., 2021; Ávila et al., 2020). After that, the participants were asked to answer sociodemographic questions (age, gender, marital status, education, occupation, and monthly income) as well as questions regarding the reasons for not consuming the Greek-style yogurt, their concerns about health, and changes in their eating habits during the Covid-19 pandemic. The participants were asked if their concerns about health

and eating habits had increased, not changed, or decreased during the pandemic. The preliminary version of the questionnaire was pre-tested for accuracy, understanding of instructions, and terminology using a web search with a convenience sample (n = 30). This step resulted in additional minor revisions to the questionnaire based on respondents' comments as well as researchers' observation during the pre-test (Su et al., 2019; Promsivapallop & Kannaovakun, 2019). The final version of the questionnaire translated into English can be seen in Supplementary Material (1S).

In order to assess the effect of the Covid-19 pandemic on consumption habits, the volunteers were also asked to answer questions related to the most and least consumed foods during this period. Moreover, it was asked for them to describe any new food products that were added to their dietary during this period. Since social isolation was adopted, new purchasing priorities have emerged in a scenario of great uncertainty, making it essential to interpret consumption habits in order to adapt business models to this new reality.

The questionnaire was elaborated through an online platform, after approval by the Ethics and Research Committee of the Federal University of Viçosa, Brazil (CAAE: 85903118.4.0000.5153; Opinion Number: 2.676.769). Data were collected through an online questionnaire between August and September 2020, during the Covid-2019 pandemic.

2.2. Participants

In this study, 346 individuals (18 years or older) from the five Brazilian regions, from which 73.7 % were women and 24.9 % were men (Table 1) responded to the questionnaire. Since online surveys involve voluntary participation, the participants are randomly selected. In this questionnaire, the participants were predominantly composed of women, people over the age of 32 and single. Interestingly, the same behavior was observed in online surveys from the UK (predominant

Table 1
Socioeconomic profile of participants (%).

Participants n = 346	(%)
Gender	
Female	73.7
Male	24.9
Age	
18 a 32	67.6
33 a 49	22.5
50 a 65	8.7
>65	1.2
Marital status	
Married	28.0
Single	63.9
Stable Union	6.6
Divorced	0.9
Widowed	0.6
Education	
Elementary School	1.2
High School	6.4
Incomplete Higher Education	21.4
Complete Higher Education	30.6
Master	16.2
Doctorate	12.1
Income	
Unemployed	2.6
Up to 1 minimum wage	7.2
1–3 salaries	36.1
3–5 salaries	21.7
5–15 salaries	25.7
More than 15 salaries	6.6
Region	
Sudeste	87.9
Nordeste	4.3
Centro-oeste	3.5
Sul	3.5
Norte	0.3

sample of women, level of education: undergraduate degree and 18–29 years old) (Robertson et al., 2021) and Asia and Africa (predominant sample under 30 years old and single) (Odeyemi et al., 2019).

The study was conducted by using a convenient sample designed to represent the actual market population and to provide relevant qualitative inferences about consumers' perceptions of different Greek-style yogurt concepts. The participants were recruited via email, social media and yogurt consumers groups. The criteria adopted for the selection of participants were their interest and availability to respond to the questionnaire.

2.3. Word association

2.3.1. Stimuli

Seven concepts of Greek-style yogurts were evaluated according to the versions of the yogurt that can be found in the Brazilian market: Traditional, Zero Fat, Light (50 % less total fat), Zero Lactose, No Added Sugar, High Protein Content, and Ultra-creamy. According to the Codex Alimentarius (2020), Greek yogurt must not contain added sugars nor proteins. In Brazil there is no legal standard for the product, however, Greek-style yogurt must contain a minimum amount of protein of 5.6 % (w/w) compared to 2.7 % (w/w) protein in regular yogurt. The nutritional composition and the ingredients list of each of the seven commercial products are shown in Table S1 and Table S2, respectively.

The stimuli used in this research were the identification of each concept in a basic image of Greek-style yogurt, allowing only the assessment of the influence of the concept information on the consumers' perceptions, since all images were identical.

The images were presented in a monadic and random way, coded with three-digit numbers according to the design proposed by Macfie and Bratchell (1989). Each image appeared in a random position the same number of times and was preceded the same number of times by the other samples. This methodology softens the effect of the order of presentation and the residual effect characterized by the influence of one sample in the evaluation of the subsequent one.

2.3.2. Customer survey

The participants evaluated the seven images according to the word association methodology proposed by Slovic et al. (1991) and Benthin et al. (1995), in which the participants had to write the first four words, thoughts, or feelings that they associated to the images of the Greek-style yogurts using the appropriate information (concepts of Greek-style yogurts).

2.4. Analysis of results

2.4.1. Word association

The responses provided by the participants were analyzed qualitatively and all valid words mentioned were taken into account for the data analysis (Guerrero et al., 2010). For this purpose, terms with similar meanings were grouped into the same category, and this classification was carried out by three Brazilian researchers, taking into consideration the interpretation of the words according to the Portuguese language dictionary. After individual data assessment, the categories were obtained through a consensus among the three researchers. This triangulation technique has been used in qualitative studies to balance the subjective influence of individuals (Guerrero et al., 2010; Vidal et al., 2013; Judacewski et al., 2019). At least 10 % of the data obtained were considered for further analysis and their frequencies were determined by the number of participants who used the selected words.

2.4.2. Chi-square

The chi-square test was used to assess the occurrence of statistical differences in the frequency of categories mentioned among the seven concepts of Greek-style yogurt. In addition, the chi-square test per cell was performed in order to identify the sources of global chi-square

variations (Symoneaux, Galmarini, & Mehinagic, 2012). The analysis was performed in the XLSTAT version 2021.1 software.

2.4.3. Prototypical analysis

The prototypical analysis was used to obtain the frequency and the order of terms used by the participants. This technique, developed by Vergès (1992), is used for the characterization and structuring of social representations from word terms. It consists of calculating the frequencies and the order of the terms to elaborate the categories that encompass the terms, evaluating their frequencies, compositions and occurrences.

To perform this analysis, the IRaMuTeQ (R INTERFACE for multi-dimensional analysis of texts and questionnaires) software, version 0.7 alpha 2, was used. A construction of a four-quadrant chart was made by using the software, where the first quadrant (upper left) shows the words that had the highest frequency of citation and lowest order of term, corresponding to the likely indicators of the central core representation. This central core representation comprises the responses provided by a large number of participants and that were promptly evoked to them. The second quadrant (upper right) contains the words frequently used in the questionnaire. On the other hand, responses with term frequencies lower than the cutoff point are in the third quadrant (lower left), also known as "contrast zone", which corresponds to the words with low frequencies of citation and evocation. These items can either complement the first periphery, or represent the opinion of a small group of participants (Abric, 2003). The fourth quadrant (lower right) presents the expressions with lower frequency and higher order of term, which are the terms that are evoked as last responses, which are considered less noticeable, and consequently less interesting for the representation of the sample.

2.4.4. Qualitative analysis

The chi-square test was carried out in order to determine how the Covid-19 pandemic and the categories regarding the concepts of Greek-style yogurt are related to the consumers' health concerns and changes in their eating habits.

IRaMuTeQ software was used to process the information obtained in the research. In this analysis, the word 'cloud' was selected, and an image graphic was produced from the evocation used to justify the question of interest. The word 'cloud' was created according to the responses provided by the participants regarding their food consumption during the pandemic and also for the reasons attributed to the non-consumption of Greek-style yogurt by the participants.

3. Result and discussion

The current study is based on the data collected by the questionnaire with the aim to explore the consumers' perception about the seven different varieties of Greek-style yogurt that can be found in the Brazilian market: traditional, zero fat, light (50 % less total fat), zero lactose, no sugar, high protein content, and ultra-creamy. In addition, the information was obtained in the context of the impact caused by the Covid-19 pandemic on the health perception and consumption habits by the consumers during social isolation. Given the subjective nature of self-report, the above results must be interpreted without disregarding this bias.

3.1. Participants' perceptions about Greek-style yogurt

This study recruited individuals that can be considered potential consumers of Greek-style yogurt. Initially, for data processing, the participants were divided into two groups: Greek-style yogurt consumers and non-consumers. Using the chi-square test, no significant difference was observed between these groups regarding their socioeconomic profiles ($p > 0.05$).

The participants mentioned a total of 9688 terms in the

questionnaire about different varieties of Greek-style yogurt. The relatively large number of responses suggests that the participants had a clear mental representation of the subject (Guerrero et al., 2010).

The association of words provided an interesting insight into the perception of consumers about the different concepts of Greek-style yogurt, which can be useful for the development and marketing of these products. Farah, Araujo and Melo (2017) reported that the acceptance of yogurt is mainly influenced by its appearance, flavor and texture, regardless of whether the product has greater nutritional value or not. Regarding the Greek-style yogurt, Desai, Shepard and Drake (2013) demonstrated that a moderate amount of sweet and sour taste, as well as a firm and dense texture, are the most preferred properties by the consumers.

In this study, it was possible to observe that the concepts of Greek-style yogurt were associated with nutritious and healthy food, a fact that is justified since consumers are aware that the consumption of strained yogurt considerably contributes to the intake of nutrients, especially proteins, vitamins and minerals such as calcium, magnesium and zinc (Adolfsson, Meydani, & Russell, 2004; García-Gómez et al., 2018). The term pleasure was also associated with this product, since the consumers evoke positive feelings and well-being when consuming this product (Morell et al., 2015). In addition, the creaminess attribute was mentioned by the consumers, due to the high content of solids, which contribute to a significant increase in the texture of the product (Desai, Shepard & Drake, 2013).

33 categories were formed by the cited related terms in more than 10 % of the questionnaires, as shown in Table 2. The 33 categories were statistically evaluated by the chi-square test, as they met the requirements for performing the test, and all of them were significantly different ($\chi^2 = 2596.369$; $p < 0.0001$) for the seven Greek-style yogurt concepts (Table 3). Therefore, it was possible to characterize each

Table 2

Examples of individual associations identified when consumers were asked to write the first four words, terms or phrases that came to mind when thinking about the different stimuli provided.

Categories	Examples
Pleasant Appearance	Pleasant Appearance, Soft, Beautiful, shine
Unpleasant appearance	Unpleasant appearance, Unattractive, Strange, Pale
Caloric	Caloric Fat, Fatty, Calories
Common	Simple Common, Normal, Basic, Common, Traditional
Color	Color, White, Pleasant Color, Yellow
Creamy	Creamy, Cream, Creaminess
Curiosity	Interesting, Curiosity, It drew attention
Dairy product	Butter, Milk, Ice Cream, Sour Cream
Sweet	Sweet, Sweetened, Sweetness, Sugar, Sugary
I would try it	I want to eat it, Willing to taste, I would try it
Familiar	Homemade, Mother, Father, Grandmother, Childhood
Fresh	Fresh, Fresh, Refreshing
Indifference	Irrelevant, Disinterested, Unnecessary, Indifferent
Industrialized	Stabilizers, Thickeners, Processed, Additives
Lactose Intolerance	Intolerance, Allergy, Allergy, Lactose, Enzyme
Light	lighter, lighter
Less caloric	No Fat, Less Calorie, Skim
Less sweet	No sweet, without sugar, less sweet
Natural	Natural, whole
Others	
Loss of sensory quality	Tasteless, Sour, Bad, Bitter, Acid, Colorless
Unhealthy	Less healthy, not healthy, not so healthy
Practicality	Recipes, Breakfast, Dessert, Coffee, Versatile
Pleasure	Yummy, Tasty, Pleasant, Wonderful, Delicious
High Price	Expensive, Inaccessible, More Expensive, Unaffordable
Food restriction	Diet, Weight loss, Food restriction, Gym, light
Pleasant taste	Flavor, Pleasant taste, Good flavor
Unpleasant taste	Bad taste, Little taste, Strange taste
Satiety	Appetite, Hunger, Satiety
Healthy	Healthy, Health, Fit, Fitness, Nutritious
Positive feelings	I love it, Happiness, Excited, Hope, Joy, Peace
Pleasant Texture	Consistent, Firm texture, Pleasant texture, Pasty
Unpleasant texture	More liquid, Thin, Less pasty, Less consistent

concept through association of words.

The ultra-creamy Greek-style yogurt (A) was associated with pleasure, creaminess, pleasant texture, caloric, tasty, healthy, sweet, practicality, and positive feelings. According to Janiaski et al. (2016), sensory properties play a key role in marketing images. In addition, attributes such as creaminess, and viscosity are of great importance for the acceptability of semi-solid dairy products (Soukoulis, Rontogianni, & Tzia, 2010). The term creaminess is described as a pleasant and desirable sensory characteristic directly related to other positive attributes, such as thickness, softness, mouth coating, and milky flavor (Antmann et al., 2011; Dickinson, 2018). Avila et al. (2020) reported that the Brazilian consumers expect creaminess, freshness, and sweetness in yogurts. A correlation between creaminess and flavor was also observed in studies with strawberry yogurts (Ward et al., 1999), corroborating the study conducted by Tournier et al. (2007) who claim that the concept of creaminess is related to a hedonic dimension.

The zero fat (B) and light (F) Greek-style yogurts were mainly associated with healthy, dietary restriction, loss of sensory quality, unpleasant texture, and less caloric. In addition, zero-fat yogurt was also related to unpleasant and light categories. The sensory properties of yogurt are highly dependent on the balance between aromatic compounds derived from milk fat, proteins and carbohydrates (Zhao et al., 2018). The partial or total removal of yogurt fat can reduce the overall quality perceived by the consumers (Folkenberg & Martens, 2003). These results are in accordance with the study conducted by Ares et al. (2008) and Pinto (2018), who reported that low-fat yogurts are associated with sensory loss of taste and texture. Studies show that the main motivations for consuming light/diet products are fitness purposes, dietary restrictions, and health benefits (Ribeiro et al., 2010). However, different flavors and inadequate texture are determinant for the low acceptance of light formulations with low sensory quality (Melo, Bolini, & Efraim, 2009; Esmerino et al., 2017). These findings are important to seek alternatives to improve the acceptance of these products.

Traditional Greek-style yogurt (C) was mainly associated with pleasure, creaminess, pleasant texture, sweet, pleasant taste, caloric, and common. The association of traditional yogurt with pleasant texture and pleasure shows the importance of sensory attributes for perception and, consequently, for image acceptance (Almi et al., 2011). Results obtained in the study carried out by Ares et al. (2008) show that traditional yogurt was mainly associated with sensory characteristics, in which the consumers experience a pleasant texture and taste in traditional foods. Furthermore, corroborating this work, Pieniak et al. (2009) reported that the consumption of traditional foods is associated with the term common.

High protein Greek-style yogurt (D) was associated with healthy, food restriction, and satiety. The high protein content makes the consumers associate this product with a healthy food, which brings health benefits and can even help with weight loss. Caseins and whey proteins provide essential amino acids for the body improving glycemic regulation (Akhavan et al., 2010; El Khoury et al., 2014) and long-term bone health (Rizzoli, 2014). However, since these yogurts are related to dietary restriction, pleasure can be compromised, a fact observed in a lower frequency ($p < 0.001$). According to Douglas et al. (2013), the consumption of protein-rich foods in diets provides better control of appetite and satiety. For this concept, unpleasant texture obtained low frequency. One of the reasons for adding proteins to the yogurt is to increase the total solids content and obtain firmer products with lower levels of syneresis (Morell et al., 2015), that are very relevant quality parameters for semi-solid yogurts (Walstra et al., 1999).

Zero lactose yogurt (E) was associated with loss of sensory quality, lactose intolerance, indifference, dairy product, and higher cost. This product is certainly the most targeted to meet the specific needs of requirements that present lactose intolerance (Adhikari et al., 2010; Asbra, 2016). In most cases, this product is more expensive when compared to other yogurts because of the lactose hydrolysis step, which results in galactose and glucose, which can increase the sweetness of the

Table 3

Frequency of mention of dimensions and categories identified in the association of words for Greek-style yogurt (N = 346).

Categories	Stimulus						
	A	B	C	D	E	F	G
Pleasant Appearance	64(+)**	34	46	35	41	37	46
Unpleasant appearance	4(-)**	25(+)**	9	13	12	17	21
Caloric	66(+)**	5(-)**	41(+)**	18	6(-)**	9(-)**	9(-)**
Common	7	1(-)**	32(+)**	2(-)*	2(-)*	5	7
Color	28	20	27	18	32	29	20
Creamy	148(+)*	107	153(+)**	111	116	116	97(-)**
Curiosity	13	11	5	14	9	3(-)*	4
Dairy product	32	20	29	21	38(+)	19	26
Sweet	53(+)**	17(-)**	64(+)**	18(-)**	46	26(-)*	33
I would try it	78(+)**	35	37	34	35	37	30
Familiar	8	5	8	3	6	5	9
Fresco	16	8	11	7	6	9	11
Indifference	25(-)**	46	33	41	74(+)**	46	43
Industrialized	14	11	5	6	6	12	7
Lactose Intolerance	3(-)**	2(-)**	2(-)**	3(-)**	129(+)**	1(-)**	1(-)**
Light	18	44(+)**	9(-)**	6(-)**	22	28	15
Less caloric	0(-)**	40(+)**	2(-)**	2(-)**	5(-)**	37(+)**	22
Less sweet	2(-)**	16	2(-)**	4(-)**	8	12	37(+)**
Natural	9	10	14	4(-)**	5(-)*	11	32(+)**
Others	160	148	129	172	197(+)**	134(-)*	139
Loss of sensory quality	27(-)**	79(+)**	28(-)**	32(-)**	56	58	123(+)**
Unhealthy	10(+)**	2	3	1	0	4	0
Practicality	47(+)**	18(-)*	35	30	21	24	28
Pleasure	302(+)**	127(-)**	259(+)**	156(-)*	141(-)**	147(-)**	126(-)**
High price	14	20	17	27	30(+)*	23	13
Food restriction	6(-)**	140(+)**	12(-)**	178(+)**	37(-)**	122(+)*	138(+)**
Pleasant taste	26	27	44(+)**	28	33	33	32
Unpleasant taste	1(-)**	19	1(-)**	11	21	20	34(+)**
Satiety	18	4(-)**	10	29(+)**	6(-)*	11	10
Healthy	52(-)**	221(+)**	76(-)**	256(+)**	133(-)**	231(+)**	190
Positive feelings	14(+)*	3	9	9	9	5	7
Pleasant texture	114(+)**	54(-)**	84(+)*	74	60	65	58(-)*
Unpleasant texture	1(-)**	41(+)**	5(-)**	3(-)**	17	32(+)**	14

Note: A: ultra-creamy; B: zero fat; C: traditional; D: high protein content; E: zero lactose; F: light; G: no added sugars. Chi-square effect per cell. (+) or (-) indicate that the observed value is greater or less than the theoretical expected value: *p < 0.05; **p < 0.01; ***p < 0.001.

product (Adhikari et al., 2010). Even though the light/diet and lactose-free versions are aimed to meeting the needs of consumers who seek to restrict or suppress the consumption of some nutrient, it is necessary to have a sensory similarity with the conventional product (Adhikari et al., 2010; Ribeiro et al., 2010).

Greek-style yogurt with no added sugar (G) was associated with food restriction, loss of sensory quality, unpleasant taste, less sweet, and natural. The quarantine influenced the consumers' lifestyle, increasing their awareness about health and quality of life, which has encouraged the practice of physical exercise, the adoption of healthy eating habits and the reduction of consumption of foods rich in sugar, salt and fat (Muscoguri et al., 2020; Ruiz-Roso et al., 2020). However, this yogurt was not considered healthy by the participants due to the awareness of the reduction/removal of sugars. In most cases, the replacement with sweeteners and other products can reduce the healthiness of the product, playing a role in their sensory profile (Esmerino et al., 2013; Paixão et al., 2014; Janiaski et al., 2016). Similar results were obtained in the study carried out by Dias et al. (2020), in which low-content and sugar-free yogurts were reported to be less sensory accepted. Generally, high sugar contents in yogurts lead to a greater acceptance, which is in agreement with the findings of Hoppert et al. (2013). However, according to Tournier et al. (2007), consumers who preferred more natural ingredients and avoid additives were willing to consume yogurt products with a less sweet taste.

According to the data obtained in this study, the ultra-creamy denomination is related to positive perceptions about the texture of Greek-style yogurt by the consumers. The adjective creamy is a very appreciated characteristic in yogurts. Moreover, "creamy" can be an effective marketing strategy to promote zero-fat and sugar-free Greek-style yogurt. In this same perception, food restriction was strongly

associated with the lack of fat and sugar in foods. Evidently, the yogurt flavor should also play a role in this marketing strategy.

In general, the perceived healthiness and positive emotions attributed to foods have opposite associations (Table 3), in the sense that traditional and ultra-creamy yogurts that evoke sweetness and high-calorie content were associated with pleasure, as expected. Moore, Horti, and Fielding (2018) have shown that natural Greek-style yogurts contain high amount of proteins and the least content of sugars when compared to the other categories. Souza et al. (2021) showed that significant reductions of sucrose in yogurts can be done without altering sensory acceptance. In this direction, future studies should consider the effect of sugar and fat reductions on consumer expectations of Greek-style yogurts, as well as their hedonic and emotion thresholds to boost the growth of this specific variety of yogurt.

3.2. Prototypical analysis

The prototypical analysis provided the frequency and order of terms given by the participants' representations. A table was created with this data with four quadrants for each concept of Greek-style yogurt evaluated, in which a set of words was presented in each quadrant, followed by the frequency of citation and the average order of term. The numbers 1, 2, ..., n. were assigned based on the order of the responses (Verges, 1992).

Regarding the cutoff points for the coordinates of the quadrants, the median criterion was used based on the order of the terms. Since there were 4 responses per participant, the cutoff value corresponds to the median value of number 4, which is 2.5 in this case. The words with an average order of recall lower than 2.5 were classified as having a low order of recall. Regarding the frequency, the words with a minimum

frequency equal to or greater than 2 were analyzed, and an overall mean frequency was determined for each concept.

The prototypical analysis provided, through the citation and average term frequencies, which attributes are most relevant for each variety of yogurt. In **Diagram 1**, it was observed that most participants related both traditional and ultra-creamy Greek-style yogurt with the words “pleasure”, “creamy” and “pleasant texture”, indicating that these were the main characteristics provided by them during the survey. Even though the term “pleasure” had a higher frequency of citations, “creamy” had a lower order of terms in both cases. Creaminess is related to the sensory perception of combined sensations of sight, smell, taste, and touch (Chen & Eaton, 2012). In general, viscous products are generally considered creamier (Kip et al., 2006). Traditional Greek-style yogurt was also associated with the terms “sweet”, “pleasant taste”, “caloric” and “common” as well as in the chi-square analysis. The expressions “healthy”, “pleasant appearance” and “practicality” corroborating the

chi-square analysis. The expressions “healthy”, “pleasant appearance” and “practicality” obtained high citation frequency in both yogurts. However, the ultra-creamy yogurt had a good acceptance, despite the fact that the product was considered caloric by the participants. The contrast zone presents the terms with low frequency of citation and order of term. In this case, for traditional yogurt, the terms “dairy derivative”, “fresh”, and “familiar” were readily mentioned, complementing the first periphery. A small group of people mentioned the terms “indifference”, “unhealthy”, and “lactose intolerance”. The same behavior was observed for the ultra-creamy yogurt, which was associated with “dairy product”, “pleasant taste”, “common”, and “curiosity” as complementary positive aspects to the first periphery, whereas few participants indicated an unpleasant appearance and texture. In the second periphery, both concepts presented the terms “color”, “loss of sensory quality”, “food restriction”, among others. In this case, the terms mentioned present a citation frequency lower than the cutoff point, in addition to a high order of terms, showing that they were not relevant in the characterization of these samples.

The consumers’ preference for healthy products low in calories, such as low-fat yogurts, has been increasing (Ozer et al., 2007). In contrast with traditional and ultra-creamy concepts, the light and zero lactose Greek-style yogurt were the most mentioned as “healthy” (Diagram 2). The terms “creamy”, “food restriction”, and “loss of sensory quality” were located in the central zone. The difference between these two concepts is that light Greek-style yogurt was related to “light” and zero lactose yogurt was associated with “lactose intolerance” (this term was even more readily mentioned) and “sweet” once lactose can intensify the sweet taste (Gallardo-Escamilla et al., 2007). For both samples, “pleasure” and “pleasant texture” had a high citation frequency despite a higher average order of term. The similarity between the concepts of zero lactose and light yogurt may have been due to the low incidence of participants with lactose intolerance or some kind of allergy to lactose. The participants who are unaware of the light version of Greek-style yogurt attributed the low interest in these products (“indifferent” term). In addition, the lactose-free product is associated with “high price”. The higher price of Greek yogurt may be due to speculation by the food industry about consumers’ expectations regarding the health benefits of this product. In general, for the consumers, the potential benefits seem to justify its higher cost (Benatti, Ramalho & Moreira, 2018).

For light yogurt, in the contrast zone, it is possible to observe that “less caloric”, “less sweet”, and “not pleasant texture” characteristics were directly related to the product by the participants, which was also observed by Janiaski et al. (2016). The total or partial removal of fat in dairy products is related to loss of sensory quality, as it affects the gel firmness and favors the separation from whey (Ramchandran & Shah, 2008). The removal of fat can affect the mouthfeel and decrease the creaminess of yogurt (Lucey & Singh, 1997). The terms: “caloric”, “positive feeling”, “curiosity”, and “unhealthy” are part of a small portion of the participants who associate this product with these terms.

Regarding the contrast zone, for the zero lactose yogurt, the participants associated it with “pleasant taste”, “mild”, “dairy product”, and “curiosity”, which may be related to the terms of the first periphery, such as “pleasure”, “less sweet”, and “less caloric”. These associations “less sweet” and “less caloric” for zero lactose yogurt lead us to infer about the low knowledge of the participants about the product. Even though the words from the second periphery are present in greater quantity when compared to the others, they present a lower frequency of citation and higher order of term, which means that these terms are set as last answers, and can be considered less interesting for most of the participants.

The zero-sugar (no added sugars) and high-protein Greek-style yogurts also showed the word “healthy” as the most mentioned (Diagram 3). Furthermore, in the central core area it was possible to find terms in common for both samples, such as “food restriction” and “creamy”. According to Dias, Sajiwani and Rathnayak (2020), the consumers’ preference tends to decrease when there is a reduction in sugar and an

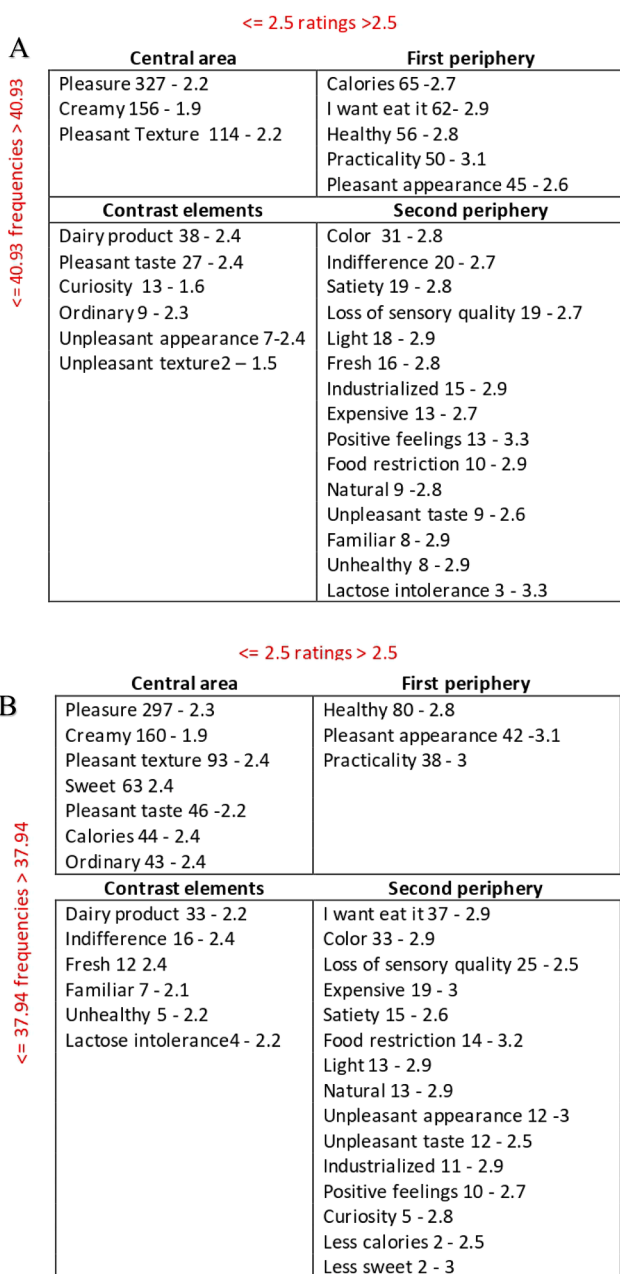


Diagram 1. Prototypical analysis of the categories established for the Ultra-creamy (A) and Traditional (B) concepts, respectively. Source: IRaMuTeQ.

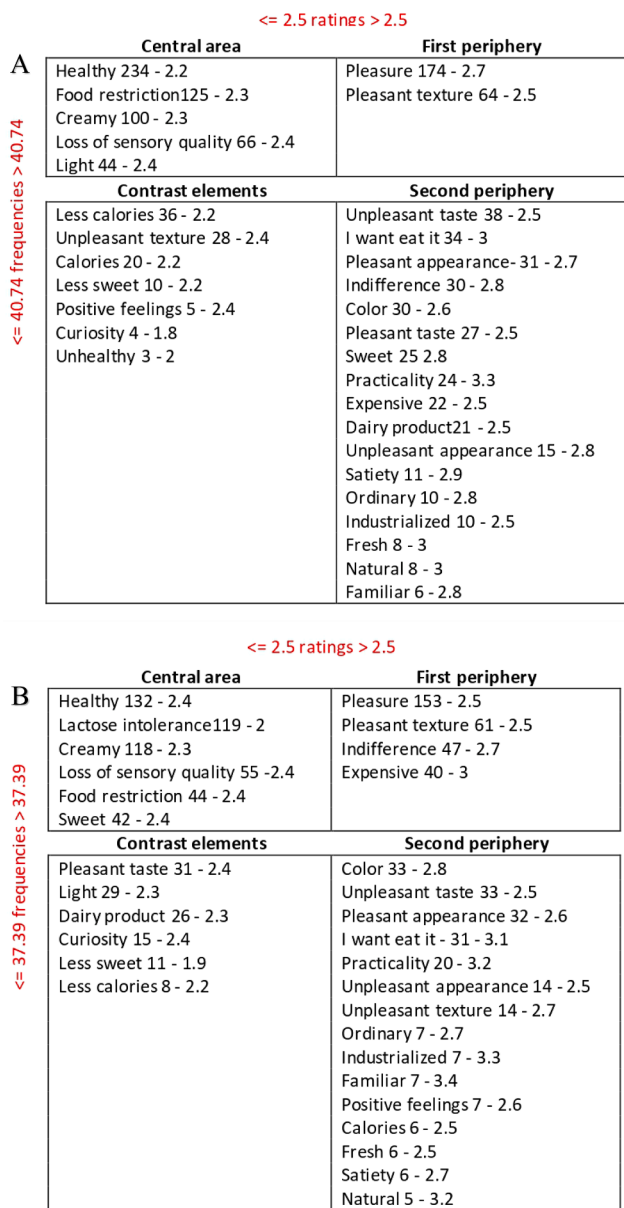


Diagram 2. Prototypical analysis of the categories established for the Light (A) and Zero lactose (B) concepts, respectively. Source: IRaMuTeQ.

increase in fat in yogurts. Participants believe that high-protein yogurt can have a “nice texture”. In fact, proteins play a fundamental role in the formation of the yogurt gel network. In general, the yogurts with higher protein content present greater firmness and viscosity, mainly due to the increased occurrence of intermolecular interactions between these proteins (Jørgensen et al., 2019). However, several researches (Akalin et al., 2012; Lee & Lucey, 2010; Frøst & Janhøj, 2007) have previously reported undesirable changes due to yogurt protein supplementation.

For the Greek-style yogurt with no added sugar, the participants associated the product with “loss of sensory quality”, which can be explained by the enhancement of the inherent acidity of the yogurt from the acids produced during fermentation. Consumers often have a pre-conceived idea that yogurt is sweet (Kuenzel et al., 2011). According to Wan et al. (2021), in addition to conferring sweetness and improving flavor perception, sugar contributes to texture formation and prevents the growth of spoilage yeasts by increasing the osmotic pressure.

In both concepts (no added sugar and high protein content), “pleasure” was presented in the first periphery with a high citation frequency even though it was mentioned later, complementing the central core. In

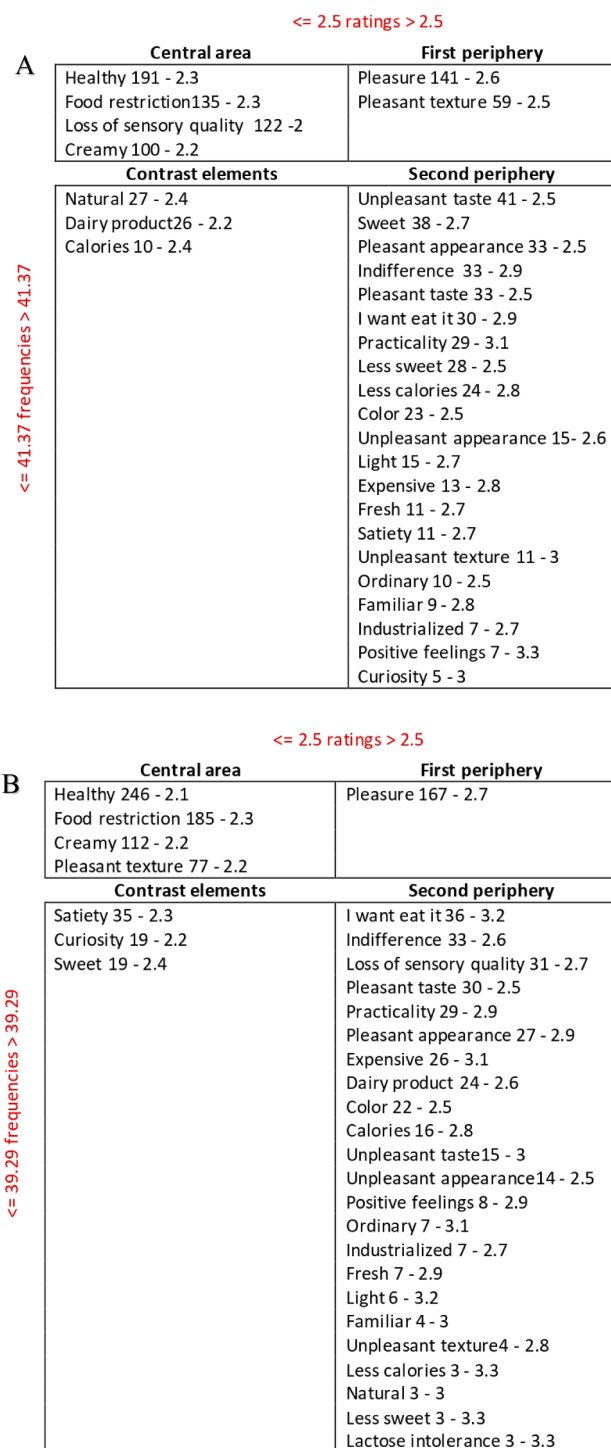


Diagram 3. Prototypical analysis of the categories established for the concepts of No added sugars (A) and High protein content (B) respectively. Source: IRaMuTeQ.

the case of no added sugar yogurt, the participants associated the absence of sugar with “natural”, “dairy product”, and “caloric”. For the yogurt with added protein, terms such as “satiety”, “curiosity” and “sweet” were reported. It is known that protein-rich foods can provide higher levels of satiety (Benelam, 2009). According to Morell et al. (2015), a yogurt added with proteins is considered ideal in terms of satiety considering the perceptions of sweetness, creaminess, texture, granulation, high density, and overall thickness.

The Diagram 4 refers to the zero fat yogurt. In this case, the word

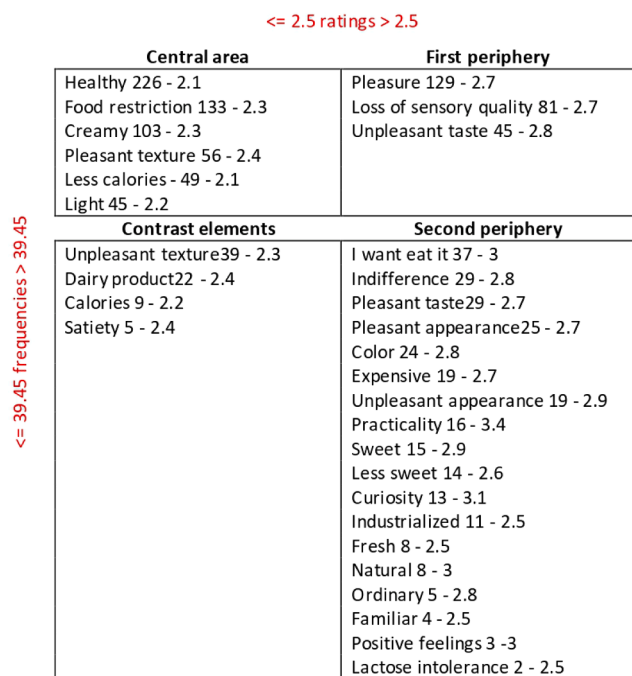


Diagram 4. Prototypical analysis of the categories established for the Zero fat concept. Source: IRaMuTeQ.

“healthy” was also the most cited, in addition to the terms such as “food restriction”, “creamy”, “pleasant texture”, “less caloric”, and “light”. The removal of fat makes the product lighter and less caloric, but the texture may be less consistent than that of traditional yogurts. The change in texture perception is a result of the modification in the structure of the gels (Kilcast & Clegg, 2002) since the fat globules of the homogenized milk are part of their network (Van Vliet, 1988). Even though the yogurt was associated with “pleasure”, it was also associated with “loss of sensory quality” and “unpleasant taste”, as a result of the removal of fat. In the contrast zone, the term “not pleasant texture” complements the first periphery, while the others: “dairy product”, “caloric”, and “satiety” were mentioned by a small part of the respondents. The expressions present in the second periphery were not relevant for the characterization of the sample.

In this context, evaluating the behavior and perception of consumers through qualitative approaches helps to identify the factors that impact the purchase and consumption of a given product. The results obtained can help companies with the reformulation of their products, as well as serve as a guide for new marketing strategies, improving the communication between regular and potential producers and consumers (Pinto et al., 2018). The understanding of associations that the consumers make regarding each yogurt concept can aid marketing in ways that reinforce the positive opinions of the target audience or to clarify them regarding some inaccurate or distorted perceptions.

3.3. Comparison of associations between participants according to health concerns

During the COVID 2019 pandemic, part of consumers increased their awareness about health and quality of life, which has encouraged healthy eating habits (Eftimov et al., 2020). In this sense, Greek or Greek-style yogurt can be a suitable option due to its high nutrient density (Morell et al., 2015). In fact, some studies report the effect of regular yogurt consumption on the occurrence of clinical symptoms of Covid-19. Since dairy products are a good source of proteins, B2 vitamin, and probiotics, these nutrients can play a role in modulating the immune system against the virus by balancing the inflammatory response and enhancing the defenses against the virus (Infusino et al., 2020; Rizou

et al., 2020). According to Rizou et al. (2020), bioactive peptides derived from milk and fermented with strains of *Lactobacillus plantarum* can disrupt the viral spike protein, which corroborates Infusino et al. (2020), who suggest that the gut may play a role in the pathogenetic evolution of the Covid disease.

In order to assess the degree of concern about health that the participants had, they were initially divided according to the level of concern about health during the pandemic (Table 4). Groups comprised those who said that their health concerns increased (66 %), did not change (29 %), or declined (5 %). There was no significant difference in the socioeconomic profile of the participants by the chi-square test ($p > 0.05$).

The share of participants who had increased health concerns during the pandemic were more interested in consuming the Greek-style yogurt, despite the fact that the product was considered as having an unpleasant taste and texture, which indicates that these consumers are willing to consume the yogurt mainly for the health benefits provided by it. Urala and Lahteenmaki (2004) observed that some food products claiming to provide health benefits are attractive to consumers despite their unpleasant taste. However, according to Verbeke (2006) compromising the taste over the health benefits in food products can be very speculative and risky in terms of marketing. Therefore, it can be concluded that the health benefits should not surpass the sensory properties of foods (SIRÓ et al., 2008). It is necessary to prepare foods that bring health benefits, maintaining the pleasant sensory characteristics to provide a good acceptance by the consumers.

The caloric and less healthy attributes were considered significant for people with high and moderate health concerns. For these groups of

Table 4

Frequency of mention of the categories identified in the association of words for groups of consumers with different levels of health concern during the pandemic.

Categories	Health concern		
	Increased	Not changed	Declined
Pleasant appearance	210	77	7
Unpleasant appearance	65	14(-)**	17(+)**
Caloric	87(-)***	85(+)**	3
Common	55	15	1
Color	115	46	13
Creamy	498(-)***	294(+)**	50(+)*
Curiosity	40	16	3
Dairy product	89(-)***	78(+)**	5
Sweet	167	72	11
I would try it	172	73	12
Familiar	38(+)**	7(-)*	0
Fresh	43	26	1
Indifference	141(-)***	139(+)**	10
Industrialized	36	19	1
Lactose Intolerance	75	37	4
Light	119(+)**	29(-)**	4
Less caloric	49(-)***	48(+)**	4
Less sweet	52	22	4
Natural	58	17	7
Others	957(+)**	299(-)***	38(-)**
Loss of sensory quality	285	141	23
Unhealthy	4(-)*	7(+)*	1
Practicality	127	49	17(+)**
Pleasure	878(+)**	332(-)*	47
High price	97	43	10
Food restriction	425	189	45(+)**
Pleasant taste	146	67	6
Unpleasant taste	54(+)**	0(-)***	3
Satiety	69	26	4
Healthy	797	310	53
Positive feelings	24(-)***	31(+)**	1
Pleasant texture	329	143	18
Unpleasant texture	90(+)*	26	2

Chi-square effect per cell. (+) or (-) indicate that the observed value is greater or less than the theoretical expected value: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

participants mentioned, the Greek-style yogurt is not as healthy as it is considered a more caloric food. The term creaminess was considered important for groups of consumers who did not have their health concerns changed. In the case of dairy products such as yogurt, the perception of creaminess is particularly important and it is not only related to textural properties, but also to fat, flavor and pleasantness (Tournier et al., 2007). Wijk et al. (2003) demonstrated that creaminess is related to fat and flavor perception, which allows an association of Greek-style yogurt with positive feelings.

The consumers who had their health concerns improved also expect to get pleasure from food intake ($p < 0.001$), therefore, the sensory characteristics in foods are essential for this group of participants (Verbeke, 2006). The familiarization of a product consolidates expectations about its sensory quality (Tuorila & Hartmann, 2020) and may be based on the fact that yogurt is a familiar product for the consumers. The idea that this product can provide health benefits is a widespread concept (Newsholme, 2002; Barrios et al., 2008; Tuorila & Hartmann, 2020). Pinto et al. (2018) suggest that similarities in the appearance of a new food with a familiar product can positively contribute to its acceptance. García-Gómez et al. (2019) observed a greater acceptance of yogurts with formulations similar to the regular yogurt, commonly consumed by the consumers, when compared to the yogurt with added transglutaminase enzyme (new product) in terms of texture attributes.

The participants who decreased concern about their health during the pandemic associated Greek-style yogurt with food restriction and practicality. For this group, social isolation may have generated an overload of stress, causing food to be considered an escape, favoring excessive consumption, especially of “comfort foods”: foods that can reduce stress by increasing positive feelings and improving mood, generally rich in sugars and carbohydrates (Muscogiuri et al., 2020; Oliveira et al., 2021). López-Moreno et al. (2020) reported that the consumers who were not practicing physical activities, gained weight, and had impaired sleep were more likely to increase the consumption of “comfort foods” during the Covid-19 pandemic. According to Lima et al. (2021), a higher consumption of processed foods is expected in this context, due to the practicality. However, these eating habits can contribute to the development of some chronic diseases, such as obesity, type II diabetes mellitus, and arterial hypertension. Therefore, it is clear that the consumption motivations of this group are not aligned with the consumption motivations of strained yogurt, which correspond to maintaining the benefits of dairy protein for health (Ribeiro et al., 2010; Jørgensen et al., 2019).

The participants were also divided according to their eating habits during the pandemic, in which they stated that they changed for the better (38 %), for the worse (25 %) or were not modified (37 %) (Table 5). No significant difference between these groups regarding the socioeconomic profile of the participants by the chi-square test ($p > 0.05$).

Participants with positive changes in their eating habits associated Greek-style yogurt to a more satiable food when compared to the group of participants who reported worsening of their eating habits. This result corroborates the studies carried out by Pinto et al. (2020), in which participants less concerned with health issues realized that healthy foods provide less satiety, which makes it difficult for them to associate healthy foods with situations of pleasure and comfort. These results indicate that healthiness for the group of people who had their eating habits worsened is more focused on hedonic motivation. In general, the lowest satiety is related to an unfamiliar product, and through its consumption the person can reconsider previous satiety expectations (Piqueras-Fiszman, 2019). Therefore, in this case, marketing strategies should be mainly focused on associating the Greek-style yogurt with a product that provides pleasure when consumed.

The participants were also asked to provide a brief information about any changes in the dietary during the social isolation. For those who changed their dietary, they were also asked to report what foods they started consuming during this period. According to the word cloud (Fig. 1), even though less relevant foods were mentioned, such as

Table 5

Frequency of mention of the categories identified in the association of words for groups of consumers with different eating habits during the pandemic.

Categories	Eating habits		
	Better	Not modified	Worse
Pleasant appearance	135(+)**	90(-)**	78
Unpleasant appearance	44	25(-)**	32
Caloric	51	55	48
Common	13(-)*	26	17
Color	79(+)*	59	36
Creamy	258(-)***	327	263(+)**
Curiosity	15	27	17
Dairy product	89(+)**	45(-)***	51
Sweet	92	109	56
I would try it	90(-)*	113	83
Familiar	22	6(-)**	16
Fresh	25	39(+)**	4(-)***
Indifference	76(-)***	166(+)**	66
Industrialized	21	26	14
Lactose intolerance	46	63	32
Light	65(+)*	50	27
Less caloric	20(-)***	58(+)**	30
Less sweet	31	33	17
Natural	29	36	20
Others	446(+)**	371(-)*	262
Loss of sensory quality	198(+)**	119(-)**	86
Unhealthy	4	11	5
Practicality	75	62	66(+)**
Pleasure	450	482	326
High price	52	49	43
Food restriction	217	223	193(+)**
Pleasant taste	71	87	65
Unpleasant taste	45	41	21
Satiety	44(+)*	30	14(-)*
Healthy	453	438	268(-)*
Positive feelings	24	14	18
Pleasant texture	191	203	115
Unpleasant texture	56(+)**	32	25

Chi-square effect per cell. (+) or (-) indicate that the observed value is greater or less than the theoretical expected value: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.



Fig. 1. Word cloud representing foods that participants started to consume during the Covid-19 pandemic.

hamburgers, pizza, chocolate, biscuits, fried foods; it was possible to observe that vegetables, fruits, salad, and yogurt were the most mentioned foods, indicating an increase in the consumption of these products during the pandemic by the participants.

Positive changes in eating habits were also observed in studies developed by Ruiz-Roso et al. (2020) and Chopra et al. (2020), carried out with individuals from Italy, Spain, Chile, Colombia and Brazil, and India, respectively. These authors reported an increase in vegetable consumption and a reduction in the weekly consumption of fast-food products. The authors attributed these results to the greater

availability of time to prepare the meals. According to Mills et al. (2017), the preparation of food at home can be a powerful tool to avoid obesity and low quality diets.

However, according to Tables 4 and 5, it is possible to observe that many are still indifferent to this product, especially the groups that claimed not to have changed their health concerns and those who did not report any changes in their eating habits. The results can indicate the reason why these consumers did not show any interest in consuming Greek-style yogurt.

According to the data systematizations by IraMuTeQ, software responsible for processing the information obtained in the research through the terms elucidated, the word cloud was selected, and a graphic image generated from the terms used as justification for the question was created.

When asked about the habit of consuming Greek-style yogurt, 61 % of the participants affirmed that they have consumed the product. For the other participants (39 %), it was asked for them to provide a reason for not consuming the product. According to the word cloud (Fig. 2), the price of the product was the main reason why these participants were not consuming the Greek-style yogurt. Other less relevant factors include: taste, texture, high fat content, consumption habits and the relative similarity to natural yogurt.

According to Boynton & Novakovic (2014), Greek-style yogurts are considered more expensive than traditional yogurts. Although in Brazil these yogurts are produced by alternative processes in order to increase productivity with cost reduction, it is believed that this price difference is due to the food industry's speculations on consumer expectations and perceptions about the benefits of Greek-style yogurt, in the sense that, for these consumers, these potential benefits seem to justify its higher cost. However, the cost of this product for the consumers may limit market expansion.

Study limitations.

The limitations of the present study include a non-representative sample size composed of health-conscious consumers, which could facilitate the identification of Greek-style yogurt concepts by these groups of consumers. However, future studies focusing on representative samples may corroborate our findings. For the industry, these objectives are a powerful tool regarding marketing strategies.

In online surveys, controlling the variability resulting from the time of evaluation, satiety or familiarity is even more difficult. However, there is the advantage of obtaining more responses in a short time in the pandemic scenario, characterized by the social distancing and enforcement of COVID-19 stay-at-home orders. In addition, Betella and Verschure (2016) also affirm that the results evaluated in a laboratory setting and online are equivalent, even with the differences in the

control and in experimental conditions.

The degusting step is crucial, and the investigation of the binomial technology and sensory properties should be investigated since different technologies and fermentation procedures impact the flavor, viscosity, and texture of the yogurts. Consequently, these factors can influence the determination of Greek-style yogurt concepts.

Our research can contribute to identifying perceptions toward Greek-style yogurt products based on new insights regarding Brazilian consumers. For future investigation, it is important to include cultural comparisons to define the sensory terms and words commonly used to differentiate Greek-style yogurts from the other yogurts. Furthermore, the focus on the price factor is determinant in the intercultural segmentation, since Greek-style yogurt is considered a high-value aggregated product in Brazil.

Despite these limitations, this study aimed to investigate how consumers interpret different types of Greek-style yogurts and future quantitative studies may be sufficient to boost these products in the market considering the expectations and demands associated.

4. Conclusion

This study elucidates how the perception of regular and potential consumers of Greek-style yogurt can vary when related to different concepts of the product. The prototypical analysis provided an identification of the characteristics associated with the different concepts of Greek-style yogurt available in the market, along with the identification of the frequency and order of evocation. The traditional and ultra-creamy concepts were associated with desirable sensory characteristics, as well as with pleasure and creaminess. The concepts of light, zero fat, zero lactose, sugar-free, and high protein content were associated with food restriction and loss of sensory quality, which is strongly related to consumers with health concerns.

For the concepts associated would be an appropriate approach with the aim of meeting sensory requirements or clarifying the fact that healthy foods too can be tasty. Marketing strategies can also play a role in the consumers' perception by emphasizing the health benefits associated with the consumption of Greek-style yogurt. On the other hand, the creamy and ultra-creamy attributes should also be brought along with pleasant sensory characteristics, associated with pleasure and well-being.

Furthermore, it was observed that approximately-two-thirds of the participants are more concerned about their health, and one-third of the participants affirmed that they had their eating habits improved during the Covid-19 pandemic. However, these changes do not vary according to gender, age, group, marital status, level of education and income.

Greek-style yogurt is a very nutritious product, composed of bioactive peptides and probiotics that can be associated with health benefits for the human body, especially in the context of the Covid-19 pandemic. However, the price of Greek-style yogurt can be a limiting factor for its consumption, health claims and favorable sensory characteristics can boost its consumption, in the post-pandemic period, as it combines sensory and nutritional characteristics favorable to consumers.

CRedit authorship contribution statement

Thaís do Carmo Vieira: Methodology, Investigation, Writing – original draft, Visualization. **Vinicius Rodrigues Arruda Pinto:** Methodology, Writing – review & editing. **Felipe Rocha:** Writing – review & editing. **Ana Clarissa dos Santos Pires:** Methodology, Writing – review & editing. **Valéria Paula Rodrigues Minim:** Methodology, Resources, Writing – review & editing. **Márcia Cristina Teixeira Ribeiro Vidigal:** Conceptualization, Methodology, Writing – review & editing, Resources, Project administration.



Fig. 2. Word cloud representing the justification of non-consumers of Greek-style yogurt for not consuming/buying this product.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

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