| ORIGINAL ARTICLE | OPEN ACCESS |

Impact of Product Labeling on Vegan Yogurt Acceptance

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ABSTRACT

Food labels shape expectations and can steer acceptance. In yogurt-like products, dairy-anchored terms may trigger mismatched expectations among non-vegans. We tested how naming affects sensory acceptance of plant-based yogurt. One hundred adults (18–60 years) were randomly assigned to two cohorts: 50 evaluated strawberry/coconut samples labeled as "yogurt," and 50 evaluated the same products labeled as "non-dairy creamy beverage" (between-subjects). Participants provided free-listing descriptors and rated overall liking on a nine-point hedonic scale. The "non-dairy creamy beverage" label elicited more positive descriptors (e.g., attractive appearance, consistent texture) and higher overall acceptance than the "yogurt" label. Liking reached 69.2% (strawberry) and 48.8% (coconut) when named non-dairy creamy beverage, versus 41.2% and 21.5% as yogurt. Naming therefore substantially shapes perception and acceptance of plant-based yogurt analogs among non-vegans, suggesting that avoiding the term "yogurt" may reduce negative carryover from dairy expectations and improve market appeal.

1 | Introduction

The growing global population, projected to reach nearly 9.8 billion by 2050 (United Nations, Department of Economic and Social Affairs, Population Division 2022), is escalating demand for food sources, notably animal-derived products such as dairy. This scenario has raised environmental and sustainability concerns, prompting an increasing shift toward plant-based diets as a strategic response (Willett et al. 2019). While dairy products have traditionally played an important role in global nutrition, they are now increasingly being complemented or replaced by plant-based alternatives derived from nuts, cereals, and legumes, driven by environmental awareness, health consciousness, lactose intolerance, and the rise of flexitarian dietary patterns (Jaeger and Giacalone 2021; Henchion et al. 2021; Adesogan and Dahl 2020).

Plant-based dairy alternatives, including yogurts, are gaining market share globally. In Brazil, 65% of consumers report consuming plant-based products at least once a week (The Good Food Institute 2022). However, despite their increasing availability, these products still face significant challenges, particularly regarding sensory acceptance among omnivorous consumers. Texture, flavor, and aroma are often perceived as inferior to their traditional dairy counterparts, which may hinder repeat purchases (Appiani et al. 2023; Cardello et al. 2022).

Beyond intrinsic product characteristics, labeling plays a critical role in shaping consumer expectations and product acceptance. The terminology used to describe plant-based products can significantly influence perceived quality and hedonic responses (Greis et al. 2023; Adise et al. 2015; Silas Souza et al. 2024). For instance, Greis et al. (2023) showed that consumers evaluated the same plant-dairy yogurt blend differently depending on whether it was labeled as "plant-based" or "dairy."

This effect is particularly relevant among non-vegan consumers, who tend to compare plant-based products to their animal-based

Practical Applications

- The research presented offers practical insights for the food industry and marketers in enhancing the appeal of plant-based products through strategic labeling.

- By analyzing how different terminologies—such as "yogurt" versus "non-dairy creamy beverage"—affect consumer acceptance, particularly among non-vegan consumers, this study provides a foundation for developing more effective product names that align with sensory expectations and increase marketability.

- Food companies can apply these findings to improve the sensory appeal and acceptance of plant-based yogurts, potentially broadening their customer base beyond traditional vegan consumers.

- Additionally, this research may provide support to regulatory bodies and marketers in making informed decisions about product labeling, ultimately contributing to a more sustainable consumer shift toward plant-based alternatives by reducing negative bias through optimized terminology.

- This approach can enhance consumer satisfaction and positively influence purchasing behavior in the growing plant-based market.

counterparts. Adise et al. (2015) found that omnivores sometimes rated vegan products more positively when explicitly labeled as plant-based—an effect likely related to perceived novelty or ethical alignment. Similarly, Silas Souza et al. (2024) investigated how naming strategies affect consumer expectations and sensory perception in plant-based desserts. Their results revealed that mismatches between label-driven expectations and actual sensory experience may lead to negative evaluations, particularly regarding texture and flavor.

Despite increasing attention to plant-based foods, few studies have explored the specific impact of labeling on vegan yogurt perception among non-vegan consumers, especially in the Brazilian context. This demographic is key to expanding the appeal of plant-based alternatives beyond niche markets. Understanding how these consumers interpret and react to different naming strategies is essential for developing and marketing products that resonate with broader audiences.

In this context, qualitative techniques such as free listing (FL) provide valuable insights by capturing spontaneous associations and consumer vocabulary. This technique reveals not only sensory impressions but also emotional and cognitive aspects of product perception (Ares and Deliza 2010; Ginon et al. 2014). Vieira et al. (2020) successfully applied FL to characterize the sensory profile of dairy products, highlighting the technique's potential for identifying descriptors based on consumer language. Previous studies have also used this approach to explore perceptions of fruits (Hough and Ferrari 2010), dairy desserts (Ares and Deliza 2010), and wine (Ginon et al. 2014). These consumer-generated descriptions, combined with hedonic and attitudinal responses, are crucial for informing product development and marketing strategies (Varela and Ares 2012).

In addition to FL, hedonic evaluation remains a cornerstone of sensory science, offering quantitative insights into consumer preferences and acceptance. Together, these techniques allow for a comprehensive understanding of how product labeling influences consumer perception. Thus, the present study aims to assess the impact of product labeling on sensory acceptance and perceptions of "vegan yogurts" specifically among non-vegan consumers, utilizing both FL and hedonic evaluation techniques. By examining how different product nomenclatures influence consumer perceptions, this research seeks to provide practical implications for marketing and consumer education strategies, facilitating greater acceptance and integration of plant-based dairy alternatives into everyday diets.

2 | Methods

The study was conducted within a controlled sensory environment, adhering to standardized protocols outlined by the International Organization for Standardization (2007), and following established good sensory practices as delineated by Lawless and Heymann (2010). Approval for the study was obtained from the Ethics Committee of the Federal University of Lavras (CAAE: 57521022.0.0000.5148), ensuring compliance with ethical guidelines. Data collection took place at the Sensory Analysis Laboratory of the Food Science Department of the Federal University of Lavras (UFLA), Brazil.

2.1 | Samples

Two commercial samples of vegan coconut milk yogurt, each in strawberry and coconut flavors, produced by Vida Veg, situated in Lavras, Minas Gerais, Brazil, were selected for analysis. Vida Veg is a company that specializes exclusively in plant-based products and does not manufacture any animal-derived items. The selected samples represent typical vegan yogurts available in the Brazilian market, both in terms of formulation and positioning.

Samples from individual batches were chosen to maintain consistency, with all packages sharing identical expiration dates. Each sample, approximately 20 g in weight and stored at refrigeration temperature (5°C) as per manufacturer specifications, was presented monadically in disposable cups, coded with three digits in a balanced order (Wakeling and MacFie 1995).

The nutritional compositions of the selected samples were very similar. The strawberry-flavored yogurt contained 7.3 g of total sugars, 2.6 g of total fat (including 2.3 g of saturated fats), and 0.1 g of protein per 100 g serving. The coconut-flavored yogurt exhibited slightly lower total sugars at 7.2 g per 100 g serving, with identical total fat (2.6 g, including 2.3 g saturated fats) and protein (0.1 g) levels.

2.2 | Participants

One hundred consumers, comprising both genders and non-vegan individuals aged between 18 and 60 years, were recruited for the study. Participants were students and administrative staff

of the Federal University of Lavras (UFLA), as well as members of the external community. Informed consent was obtained from all participants, indicating their voluntary agreement to partake in the sensory evaluations. After the sensory tests, participants completed a questionnaire to collect sociodemographic data with the aim of characterizing the groups.

Participants were residents of the Southeast region of Brazil and predominantly young adults. In the group that evaluated the products labeled as "non-dairy creamy beverage," 90% were between 18 and 30 years old, and 10% were between 31 and 44 years old; 72% were female, and 67% had incomplete higher education. In the group that evaluated the samples labeled as "yogurt," 87% were aged 18–30, and 13% were aged 31–44; 70% were female, and 58% had incomplete higher education. Additionally, all participants in both groups reported consuming dairy yogurt at least once a week. The two groups were similar in terms of age range, gender distribution, education level, and yogurt consumption habits, indicating comparability in both demographic characteristics and basic consumer behavior.

2.3 | Sensory Evaluation

The participants were divided randomly into two groups, each consisting of 50 participants. One group evaluated the vegan yogurt variants labeled as "strawberry yogurt" or "coconut yogurt," while the other group assessed the samples as "strawberry non-dairy creamy beverage" or "coconut non-dairy creamy beverage."

All evaluations were conducted without utensils: participants consumed the samples directly by sipping from identical serving containers, irrespective of label assignment. This procedure reflects the usual mode of consumption for this product, whose texture is sufficiently liquid to be sipped (more fluid than traditional dairy yogurts). Samples were served in identical cups coded with three-digit random numbers to maintain blinding. Presentation (container and portion) was identical across conditions.

The term "yogurt" was chosen for its familiarity and association with traditional dairy products, while "non-dairy creamy beverage" was selected as a more neutral, descriptive alternative that avoids direct comparison with animal-based yogurt. This approach aligns with regulatory trends and industry practices aimed at clarifying plant-based labeling and preventing consumer misunderstanding (Silas Souza et al. 2024).

Upon receiving the samples, participants were first instructed to conduct a general sensory evaluation encompassing visual, olfactory, and gustatory aspects. They were then asked to freely write down all sensory descriptors associated with each sample using the FL technique (Hough and Ferraris 2010; Amorim et al. 2023). This approach allowed for the spontaneous and unstructured capture of both positive and negative descriptors, reflecting how consumers naturally perceive and describe sensory characteristics.

After completing the FL task, participants rated their overall sensory acceptance of each sample using a nine-point hedonic scale, ranging from "extremely disliked" to "extremely liked" (Stone and Sidel 2004).

2.4 | Data Analysis

The FL data was analyzed using triangulation (Amorim et al. 2023), comprising qualitative scrutiny alongside an assessment of mention frequency. Associations and terms with akin meanings were qualitatively analyzed and collated into groups, followed by a frequency count of mentions. Visualization of data entailed the creation of word clouds to illustrate the frequency of mentions linked to descriptors denoting positive and negative descriptors associated with the samples (Silas Souza et al. 2024; Benatti et al. 2025). In addition, a chi-squared test of independence was conducted to evaluate whether the frequency of mention of specific terms differed significantly between labeling conditions.

For the hedonic scale data, a Student's t-test for independent samples ($p < 0.05$) was applied to compare the mean overall liking scores between the two labeling conditions. Additionally, responses from the nine-point hedonic scale were recategorized into three acceptance levels: Dislike (score < 4), Indifferent (score $= 5$), and Like (score > 6), enabling categorical frequency comparisons. Frequency histograms were constructed to visually represent the distribution of participants across the acceptance categories (Amorim et al. 2023). A chi-squared goodness-of-fit test was used within each labeling condition ("yogurt" and "non-dairy creamy beverage") to assess whether the distribution of acceptance responses differed significantly from a uniform distribution. A chi-squared test of independence was performed to examine whether the acceptance distribution was associated with the labeling condition.

All statistical analyses were performed using Jamovi software, version 2.6.44.

3 | Results

3.1 | Free Listing

Figure 1 illustrates the positive and negative descriptors associated with each labeling variant of vegan yogurt, in both strawberry and coconut flavors. These word clouds reflect the most frequently mentioned sensory terms across conditions.

Regarding texture-related terms, significant differences were observed between the labeling conditions. For the strawberry-flavored product, the term watery was frequently cited as a negative descriptor regardless of the applied denomination, while aroma was identified as a positive descriptor. For the positive descriptor "texture," no significant difference was found between samples (32% vs. 28%, $p = 0.663$). However, "texture" was more frequently cited as negative under the "non-dairy creamy beverage" label (54% vs. 10%, $p < 0.001$), accompanied by the descriptor "too consistent" (13%, $p = 0.012$). Conversely, the descriptor "consistency" (positive) was more often associated with the "yogurt" label (24% vs. 0%, $p < 0.001$). Several other descriptors showed statistically significant differences in frequency
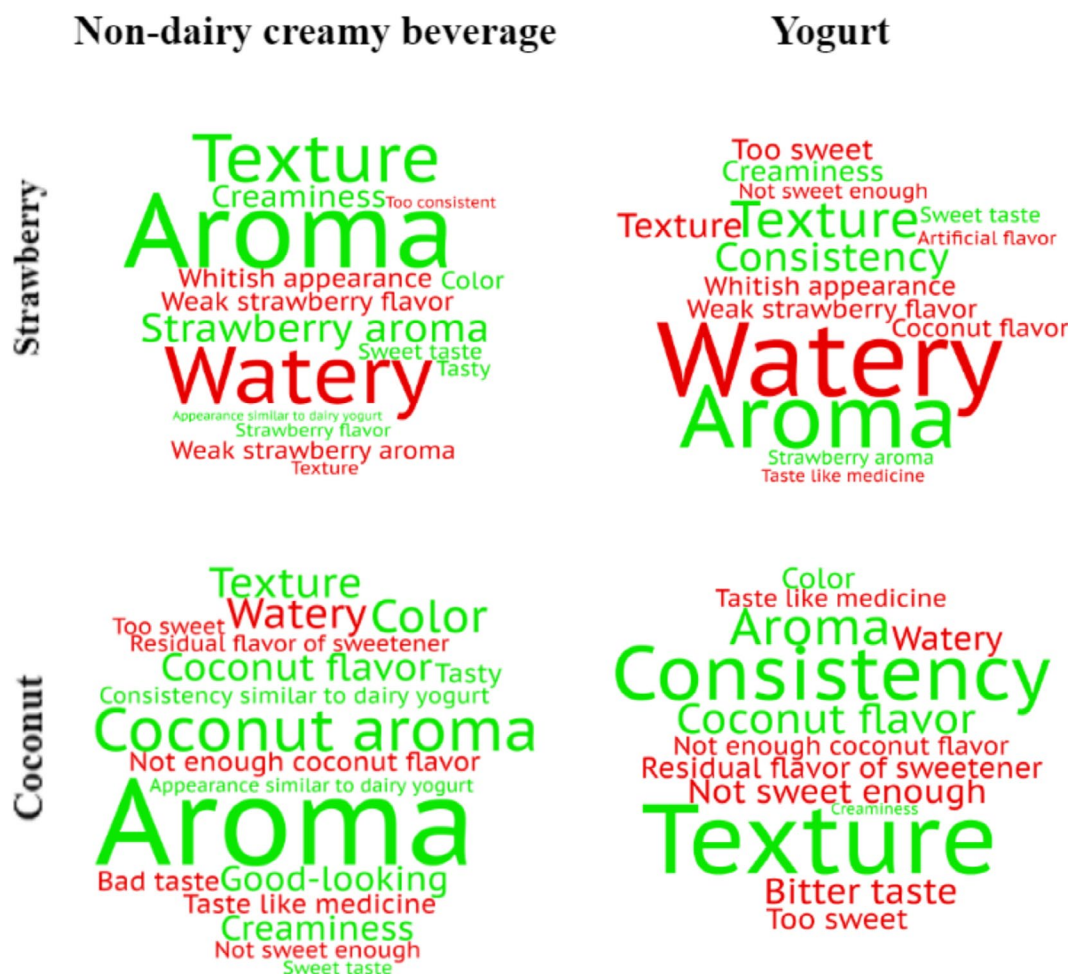
FIGURE 1 | Word cloud illustrating positive (green) and negative (red) aspects for the product denominations tested.

between the two labeling conditions (Table 1). The "non-dairy creamy beverage" label was associated with more frequent mentions of aroma (49% vs. 26%, $p = 0.023$), color (21% vs. 0%, $p < 0.001$), strawberry flavor (15% vs. 0%, $p = 0.003$), and tasty (18% vs. 0%, $p = 0.002$). In contrast, artificial flavor, too sweet, coconut flavor, and taste like medicine were more often cited in the "yogurt" condition (all $p < 0.05$).

Although the coconut flavor product was less frequently described as watery, coconut flavor was consistently referenced as a positive descriptor for both labeling variants. Interestingly, under the "non-dairy creamy beverage" label, positive descriptors related to appearance, such as color and good-looking, were more commonly mentioned, while under the "yogurt" label, descriptors related to texture, such as consistency, were highly cited (Figure 1).

Statistical analysis also revealed significant differences for the coconut flavor (Table 2). The "beverage" label elicited more mentions of aroma (56% vs. 31%, $p = 0.009$), sweet taste (23% vs. 0%, $p = 0.012$), and tasty (16% vs. 0%, $p = 0.003$). However, bitter taste was more frequently cited as a negative descriptor in the "beverage" group (56% vs. 31%, $p < 0.001$).

Overall, for both products, the frequency of positive descriptors outweighed the negative descriptors when labeled as "non-dairy

creamy beverage." Furthermore, appearance and consistency similar to dairy products were mentioned as positive descriptors, indicating consumers' comparison between plant-based and dairy products. "Not enough strawberry/coconut flavor" was also cited as a negative descriptor.

3.2 | Consumer Acceptance

Table 3 shows the average liking scores for each product based on labeling condition. Products labeled as "non-dairy creamy beverage" received significantly higher scores than those labeled as "yogurt" for both flavors. For the strawberry flavor, the mean score increased from 4.58 ± 2.09 to 5.72 ± 1.63 ($p < 0.001$), and for the coconut flavor, the mean score increased from 3.44 ± 2.17 to 5.08 ± 2.17 ($p < 0.001$).

To further explore consumer responses, the nine-point hedonic scale ratings were recategorized into three acceptance levels: Dislike (score < 4), Indifferent (score $= 5$), and Like (score > 6). The distribution of responses across these categories is shown in Figure 2.

A chi-squared test of independence was performed to assess whether the distribution of acceptance levels was influenced by the labeling condition. The results showed a significant

TABLE 1 | Percentage of consumers who mentioned each descriptor for strawberry-flavored vegan yogurt under two labeling conditions ("yogurt" and "non-dairy creamy beverage").

		Yogurt (%)	Non-dairy creamy beverage (%)	χ^2	p
Positive mentions	Appearance similar to dairy yogurt	0	10	5.26	0.022*
	Aroma	26	49	5.19	0.023*
	Color	0	21	11.1	< 0.001*
	Consistency	24	0	13.6	< 0.001*
	Creaminess	18	26	0.932	0.334
	Strawberry aroma	12	33	6.83	0.009*
	Strawberry flavor	0	15	8.7	0.003*
	Sweet taste	12	18	0.706	0.401
	Tasty	0	18	9.89	0.002*
	Texture	32	28	0.19	0.663
Negative mentions	Artificial flavor	12	0	6.38	0.012*
	Coconut flavor	16	0	8.7	0.003*
	Not sweet enough	12	0	6.38	0.012*
	Taste like medicine	10	0	5.26	0.022*
	Texture	10	54	22.2	< 0.001*
	Too consistent	0	13	6.38	0.012*
	Too sweet	18	0	9.89	0.002*
	Watery	34	33	0	1
	Weak strawberry aroma	0	10	5.26	0.022*
	Weak strawberry flavor	52	54	0.04	0.841
	Whitish appearance	38	49	1.02	0.313

Note: Chi-squared test of independence was used to compare descriptor frequencies between labeling conditions. Significant differences ($p < 0.05$) are indicated with an asterisk.

association between label and acceptance level for both products. For the strawberry flavor, 69.2% of participants indicated they liked the sample when labeled as a "non-dairy creamy beverage," compared to only 41.2% when labeled as "yogurt" ($\chi^2 = 7.77$, $p = 0.021$). Similarly, for the coconut flavor, 48.8% of participants reported liking the "beverage" version, while only 21.5% liked the "yogurt" version ($\chi^2 = 6.02$, df = 2, $p = 0.049$).

In addition, a chi-squared goodness-of-fit test was conducted within each labeling condition to determine whether the distribution of responses (Like, Indifferent, Dislike) differed significantly from a uniform distribution. The results indicated that the response distributions were significantly non-uniform in all cases: for the strawberry flavor, $\chi^2 = 10.9$, $p = 0.004$ (yogurt label) and $\chi^2 = 31.5$, $p < 0.001$ (non-dairy creamy beverage label); and for the coconut flavor, $\chi^2 = 31.7$, $p < 0.001$ (yogurt label) and $\chi^2 = 7.88$, $p = 0.019$ (non-dairy creamy beverage label).

4 | Discussion

The trend of using terminologies that dissociate plant-based products from animal-derived ones is gaining acceptance in various countries, as exemplified by the designation "non-dairy creamy beverage" for vegan yogurts. Supported by legislation in France, where such associations are prohibited (France 2022), this trend highlights the importance of strategic labeling in shaping consumer expectations and enhancing product acceptance.

However, the use of terms like "yogurt" or "non-dairy beverage" is not only a matter of consumer perception but also regulatory significance. Baptista and Schifferstein (2023) highlight that the terminology used for plant-based dairy alternatives varies widely across countries and lacks global standardization. While some countries, such as France, have enacted strict regulations prohibiting the use of dairy-associated terms for plant-based products (France 2022), others allow more flexible labeling practices depending on local norms or evolving guidelines—such as Japan, where terms like "milk" and "meat" are permitted for plant-based alternatives (Neo 2021). This regulatory ambiguity reflects an ongoing debate between protecting consumer clarity and supporting innovation in plant-based markets.

In Brazil, for instance, there is currently no unified regulation restricting the use of dairy-associated terminology for plant-based products. The country is in the process of developing such guidelines through a public consultation initiated by the Brazilian Ministry of Agriculture and Livestock (Ministério da

TABLE 2 | Percentage of consumers who mentioned each descriptor for coconut-flavored vegan yogurt under two labeling conditions ("yogurt" and "non-dairy creamy beverage").

		Yogurt (%)	Non-dairy creamy beverage (%)	χ^2	p
Positive mentions	Appearance similar to dairy yogurt	16	14	13.6	<0.001*
	Aroma	31	56	6.9	0.009*
	Coconut aroma	17	20	23.5	<0.001*
	Coconut flavor	16	28	0	1
	Color	37	32	2.1	0.148
	Consistency	16	14	11.1	<0.001*
	Consistency similar to dairy yogurt	14	16	7.53	0.006*
	Creaminess	16	14	0.06	0.799
	Good-looking	19	26	11.1	<0,001*
	Sweet taste	0	23	6.38	0.012*
	Tasty	0	16	8.7	0.003*
	Texture	0	20	0.05	0.822
Negative mentions	Bad taste	23	24	8.7	0.003*
	Bitter taste	31	56	11.1	<0.001*
	Not enough coconut flavor	20	0	0.396	0.529
	Not sweet enough	19	14	0.298	0.585
	Residual flavor of sweetener	0	37	0.07	0.779
	Taste like medicine	0	14	0.07	0.779
	Too sweet	0	12	0.07	0.779
	Watery	0	16	0.932	0.334

Note: Chi-squared test of independence was used to compare descriptor frequencies between labeling conditions. Significant differences ($p < 0.05$) are indicated with an asterisk.

TABLE 3 | Mean overall acceptance scores (±standard deviation) for strawberry and coconut vegan yogurt labeled as "yogurt" or "non-dairy creamy beverage."

	Yogurt	Non-dairy creamy beverage	p
Strawberry	4.58 ± 2.09	5.72 ± 1.63	<0.001[a]
Coconut	3.44 ± 2.17	5.08 ± 2.17	<0.001[a]

[a]Significant differences ($p < 0.05$) measured by Student's *t*-test.

Agricultura e Pecuária [2023]). The draft proposal suggests allowing expressions such as "análogo vegetal de iogurte" (plant-based yogurt analog) or "iogurte vegetal" (plant-based yogurt), provided that the word "vegetal" is visible to the consumer. In this context, the use of alternative and descriptive terms like "non-dairy creamy beverage" in the present study is justified—not as a regulatory claim, but as a plausible label variation aimed at examining its effects on consumer perception.

Accordingly, our primary objective was to assess how consumer perception is shaped by naming conventions currently used in the marketplace. We therefore compared two commonly used terms for products in the same category—"yogurt" and "non-dairy creamy beverage"—both plausible within current regulatory frameworks. Our choice of terminology was not intended to mislead but to isolate the effect of naming on expectations and acceptance. As regulations evolve, aligning labeling strategies with regional policies remains essential to maintain consumer trust. Our findings support this perspective, demonstrating that labeling conventions can significantly shape consumer perception and liking, even when the product formulation remains unchanged. In particular, the fact that our participants were non-vegans strengthens the practical relevance of the results. This demographic is especially important for the plant-based industry, as their perceptions and acceptance levels strongly influence the potential market growth and mainstream adoption of plant-based alternatives. By focusing specifically on non-vegan consumers, this study provides valuable insights into the barriers and opportunities present when attempting to attract a broader audience beyond vegan or vegetarian consumers.

These findings are in line with previous research. For instance, the study by Silas Souza et al. ([2024]) reported significant effects of product nomenclature on consumer evaluations of plant-based foods. Similarly, Baptista and Schifferstein ([2023]) observed that animal imagery on plant-based products
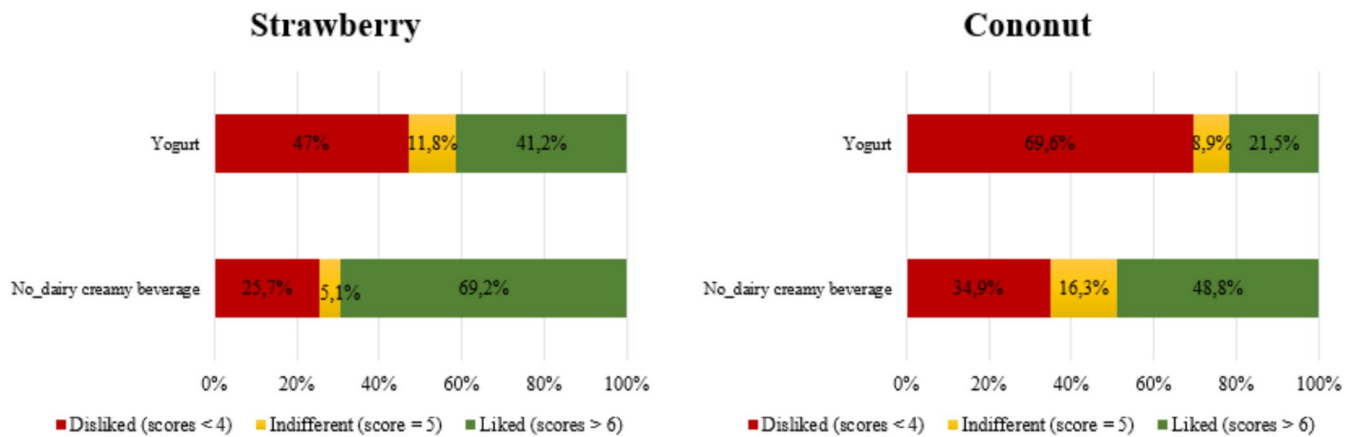
FIGURE 2 | Histogram of the acceptance rates of vegan yogurt samples.

increased confusion regarding product origin and influenced sensory expectations. Their study further indicated that specific terms on packaging significantly affected the expected origin of the food matrix, with terms like "mousse" or "milk" strongly associated with animal-derived products, while alternatives such as "creamy dessert," "milk," or "beverage" suggested plant-based content.

Greis et al. (2023) also demonstrated that the labeling of plant-based yogurts had a significant impact on texture perception and liking. They observed that the US and Finnish consumers tended to evaluate the same plant-based yogurt differently depending on whether it was labeled as "plant-based yogurt" or simply "yogurt," suggesting that expectations tied to traditional dairy played a strong role in hedonic evaluation. Similarly, Adise et al. (2015) found that omnivores evaluated vegan meat analogs more favorably when they were informed in advance that the products were plant-based—likely because this reduced the expectation mismatch. These studies support our current findings, reinforcing that the nomenclature of plant-based products can meaningfully influence consumer perception and acceptance.

Further reinforcing this connection, Sogari et al. (2023) showed that labeling affected the perception of plant-based burgers. They offered two plant-based burgers (one referred to as pea protein burger and one as animal-like protein burger); one hybrid meat-mushroom burger; and one 100% beef burger. The results indicated that the "animal-like protein burger" was generally preferred, followed by the 100% beef burger. However, in blind evaluations, there was no significant difference between the beef- and plant-based burgers. Interestingly, in this condition, the pea protein burger was preferred over the hybrid, which changed when consumers were aware of the protein used. These examples illustrate the powerful role of naming in shaping consumer expectations and align with our findings that neutral or innovative labels (e.g., "non-dairy creamy beverage") may lead to more favorable responses than familiar yet misleading terms (e.g., "yogurt").

To better understand the mechanisms behind these perceptual effects, it is essential to consider the cognitive and emotional processes that govern food evaluation. When interacting with food or beverages, our brain begins by relating previously stored information to the new stimuli presented by the food to

be evaluated. From prior knowledge about the product to its visual appearance, aroma, and even the consumption context, all these factors create significant expectations about the experience (Schifferstein 1996; Spence 2011; Spence and Piqueras-Fiszman 2014; Woods et al. 2010). Visual cues, product names, and context all contribute to this anticipatory process.

In our study, labeling terminology played a central role in shaping those expectations, which in turn affected sensory perception. The FL data (Figure 1, Tables 1 and 2) revealed that positive descriptors—especially related to appearance, aroma, and texture—were more frequently mentioned than negative ones when the product was labeled "non-dairy creamy beverage." In contrast, flavor-related negative descriptors appeared more often under the "yogurt" label. This suggests that participants initially formed favorable expectations based on appearance and aroma. However, when the evaluators tasted the product, these expectations were disrupted because the flavor did not align with their anticipations, resulting in negative flavor-related descriptors.

Theories of expectation disconfirmation can help explain this phenomenon. (1) Assimilation theory, sometimes linked to cognitive dissonance, suggests that the consumer adjusts their perception of the product to minimize the difference between expectation and actual experience. Previous studies (Tuorila et al. 1994) have demonstrated that product evaluations tend to align with consumers' prior expectations. (2) Contrast theory, on the other hand, occurs when the consumer amplifies the discrepancy between expectation and reality, resulting in evaluations in the opposite direction (Cardello and Sawyer 1992). (3) Exaggerated negativity emerges when an individual negatively evaluates a product due to unmet expectations, regardless of whether the product is perceived as better or worse than expected. (4) Assimilation/contrast model suggests that when the discrepancy between expected and experienced is small, assimilation is likely. However, if the discrepancy is significant, contrast occurs (e.g., Yeomans et al. 2008). Importantly, our study used a between-subjects design; therefore, we do not test assimilation versus contrast within individuals, but rather examine label-induced expectation effects at the group level.

Corroborating with the psychological theories studied by the authors, our results showed that the descriptor "aroma" was the most frequently cited positive term for both flavors under

the "non-dairy creamy beverage" label, accompanied by "coconut aroma" and "strawberry aroma." However, this pattern did not hold for the "yogurt" label, where "aroma" received fewer mentions, and "coconut aroma" and "strawberry aroma" were not noted.

We therefore interpret the pattern as a label-induced expectation effect consistent with contrast theory: the term "yogurt" likely evoked participants' prior experiences with dairy yogurt and, upon tasting, led them to compare the product with these past experiences, amplifying the perceived discrepancy and reducing aroma mentions relative to the same product labeled "non-dairy creamy beverage." In other words, the contrast arises through expectations generated by the nomenclature, prompting participants to benchmark what they were tasting against their remembered yogurt experiences. Consistent with the study design, this interpretation does not adjudicate assimilation contrast within the same individuals, but indicates that naming can shift expectations and resultant evaluations across cohorts. The most cited negative descriptor was "watery," observed in both flavors and labels, although in varying proportions. This descriptor likely reflects perceptions of both mouthfeel and overall consistency, possibly due to a lack of structure or flavor in the product, as also suggested by terms such as "lack of coconut flavor" and "weak strawberry flavor," associated with both labels. Since this descriptor was linked to both nomenclatures and flavors, the result does not seem to be related to the expectation linked to labeling, but rather to the sensory characteristics of the product itself.

In addition, for the strawberry flavor, differences were also observed for the descriptor "consistency," which was more often cited under the "yogurt" label, whereas terms such as "texture" and "too consistent" were more frequently mentioned in the "non-dairy creamy beverage" condition. Since the samples were physicochemically identical, these differences do not reflect intrinsic sensory properties but rather label-induced expectation effects. The terminology "yogurt" may have primed participants to attend more closely to thickness and creaminess, encouraging them to describe this dimension as "consistency." In contrast, the "non-dairy creamy beverage" label elicited a more neutral frame of reference, leading participants to redistribute their vocabulary between "texture" (sometimes positive, sometimes negative) and "too consistent." This lexical redistribution indicates that the label shaped how consumers expressed their perception of mouthfeel, reinforcing that texture remains a critical challenge in plant-based yogurts and one that is highly sensitive to naming conventions. As observed by Ludden et al. (2009), the more familiar we are with a specific product, the more likely we are to have accurate expectations about it. In this context, consumers likely relied on their familiarity with traditional dairy yogurts as a benchmark, leading to disappointment when sensory experiences did not align. This suggests that product familiarity can shape not only consumer expectations but also their sensory perceptions and hedonic evaluation.

The use of dairy products as a reference was evident in descriptors such as "appearance similar to dairy yogurt" and "consistency similar to dairy yogurt," highlighting that non-vegan consumers heavily rely on their familiarity with animal-derived products when evaluating plant-based alternatives.

Consequently, unmet expectations often led to exaggerated negativity toward vegan yogurts labeled directly as "yogurt," reflected by the higher frequency of negative descriptors and lower liking scores.

Overall, there was a higher frequency of negative terms compared to positive ones for the "yogurt" label in both flavors. This aligns with the less favorable acceptance scores observed for this label (Table 3, Figure 2). These findings align with the psychological theory of exaggerated negativity, which posits that when expectations are unmet, especially when shaped by familiar sensory standards, consumers tend to evaluate the product more harshly. Thus, labeling a plant-based product as "yogurt" may have unintentionally heightened consumer expectations, setting the product up for failure when it did not meet the sensory qualities associated with traditional dairy yogurt.

Both samples were nutritionally very similar (only a 0.1 g difference in total sugar; identical fat and protein; Section 2.1), supporting that differences in descriptors and liking stemmed from labeling rather than formulation. Because these products reflect typical vegan yogurts in Brazil, the findings carry strong ecological validity for real consumer contexts.

FL played a central role in revealing unmet expectations through spontaneous consumer language—preserving ecological validity and capturing naturally associated attributes (Sogari et al. 2023; Ares and Deliza 2010). The method is also user-friendly and cost-effective for exploratory work (Dos Santos et al. 2015; Kim et al. 2023). In our data, terms like "watery," "not sweet enough," "coconut flavor," and "good-looking," as well as comparisons such as "appearance similar to dairy yogurt," reflected both hedonic judgments and cognitive benchmarks against dairy.

5 | Limitations

The FL technique entails well-known limitations: participants often use vague or hedonic terms; semantically similar words must be grouped post hoc—a time-consuming step that can introduce researcher bias; intensity is not quantified; and statistical robustness is lower than that of QDA. Although some studies indicate that FL can yield a concise vocabulary comparable to structured or rapid approaches (Dos Santos et al. 2015; Kim et al. 2023), we emphasize its role as a complementary method. In the present work, combining FL with hedonic acceptance tests helped align qualitative impressions with the products' organoleptic properties and clarified sensory and emotional drivers of liking.

Second, while the total sample comprised 100 non-vegan consumers, the between-subjects design split participants into two independent groups of 50, which may limit statistical power and generalizability. Similar sample sizes have been used in consumer studies involving hedonic evaluation and FL (Ares et al. 2011; Hiscock et al. 2020; Vieira et al. 2020; Kim et al. 2023), yet larger and more diverse samples would enable more robust analyses, including subgroup comparisons and multivariate modeling. It is plausible that a broader sample would yield more

precise estimates and reveal additional patterns. Nonetheless, the consistency of trends across both flavors suggests some reproducibility and reinforces the robustness of the labeling effect. Future research should replicate these findings with larger and more heterogeneous consumer bases to confirm the effects and further examine individual differences in the perception and acceptance of plant-based products.

6 | Conclusion

Our findings reveal that the terminology used to describe vegan yogurts influences sensory acceptance and perceived quality among consumers. Terms like "yogurt" and "non-dairy creamy beverage" shape participants' expectations and sensory experiences differently, which in turn may affect their willingness to accept or reject a product.

FL results showed that samples labeled as "non-dairy creamy beverage" received more positive descriptors—such as "aroma" and "good-looking"—while the "yogurt" label was more often associated with negative terms like "watery" and "weak flavor." Regarding consumer acceptance, products labeled as "non-dairy creamy beverage" achieved significantly higher liking scores for both flavors ($p < 0.001$). For the strawberry flavor, 69.2% of participants indicated they liked the sample, compared to only 41.2% under the "yogurt" label. These findings suggest that more neutral and descriptive naming can enhance consumer perception and acceptance of plant-based products.

Thus, this study contributes to the understanding of how product labeling influences consumer responses to plant-based alternatives. By showing how terminology shapes expectations and sensory experience, the results may inform future marketing strategies and regulatory discussions, especially as countries develop clearer labeling guidelines for plant-based dairy analogs.

Future research could explore the perceptions of vegan consumers and compare these findings with those from non-vegan consumers to identify differences in expectations and preferences. Additionally, studies could include a different variety of flavors and labels to assess the consistency of observed results across different contexts. Investigating how branding, packaging, or pricing interacts with product naming would also be valuable to broaden consumer acceptance.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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