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Veganwashing? Performance of vegan green labels in relation to consumers

Veganwashing? Desempenho dos selos verdes veganos frente o consumidor

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ABSTRACT

Background: There are few studies on the practice of veganwashing, understood as the misleading marketing communication of vegan value, an offshoot of greenwashing. The study is therefore an unprecedented effort to assess the appeal of the vegan consumer, considering the possibility of veganwashing.

Objective: The study aimed to analyze the performance of green vegan labels in consumer views, considering the possibility of veganwashing, in terms of product evaluation, evaluation of the product as vegan, consumer skepticism, label recall, and evaluation of the green label practice.

Method: A hypothetical-deductive methodological approach was adopted, carried out through two subsequent experiments: the first exploratory (n=20), with implicit data collection using eye tracking, followed by the explanatory (n=147), with self-reported data collection. In both cases, three packages of a food product (milk) were compared, differentiating the exposure of the green vegan label: true (SVB), false (veganwashing), and absent.

Results: The true vegan label led to a better evaluation of the product as vegan, as well as less consumer skepticism, corroborating its competitive advantage. Despite this, the distinction proved to be valid mainly in the absence of a label, rather than in the presence of a false label, indicating the consumer's inability to identify veganwashing and distinguish it from genuine vegan actions. Furthermore, the consumer's dietary pattern proved to be a significant factor in reducing this vulnerability.

Conclusion: It was possible to attest to the value-adding capacity of the true vegan label, particularly in terms of certifying the product as vegan and reducing consumer skepticism. Despite this, the lack of distinction between true and false labels was also noted, in that the mere presence of a green label can generate a positive consumer reaction, which indicates the influence of veganwashing practices.

Keywords: green labels; vegan label; veganism; greenwashing; veganwashing.

Contextualização: São escassos os estudos voltados à prática de veganwashing, entendido como a comunicação mercadológica enganosa do valor vegano, uma ramificação do greenwashing. Assim, posiciona-se o estudo como um esforço inédito de apreciação do apelo vegano frente ao consumidor, considerando a possibilidade de veganwashing.

Objetivo: Analisar o desempenho dos selos verdes de apelo vegano frente ao consumidor, considerando a possibilidade de veganwashing, em termos de avaliação do produto, apreciação do produto como vegano, ceticismo do consumidor, lembrança do selo e avaliação da prática de selos verdes.

Método: Adotou-se um procedimento metodológico de abordagem hipotético-dedutiva, realizado por meio de dois experimentos subsequentes: o primeiro exploratório (n=20), com coleta de dados implícitos de monitoramento ocular, seguido do explicativo (n=147), com coleta de dados autodeclarados. Em ambos os casos, foram comparadas três embalagens de um produto alimentício (leite), diferenciando-se a exposição do selo verde de apelo vegano: verdadeiro (SVB), falso (veganwashing) e ausente.

Resultados: O selo vegano verdadeiro retornou melhor apreciação do produto como vegano, bem como menor ceticismo do consumidor, corroborando seu diferencial competitivo. Apesar disso, tal distinção se mostrou válida principalmente diante da ausência de selo, e não do selo falso, indicando a falta de capacidade do consumidor de identificar o veganwashing e distingui-lo perante ações veganas efetivas. Ainda, o padrão alimentar do consumidor se mostrou influente na diminuição desta vulnerabilidade.

Conclusão: Foi possível atestar a capacidade de agregação de valor do selo vegano verdadeiro, em especial em termos de certificação do produto como vegano e diminuição do ceticismo do consumidor. Apesar disso, também se apontou a falta de distinção entre o selo verdadeiro e falso, na medida em que a mera presença de um selo verde pode gerar uma reação positiva do consumidor, indicando a capacidade de influência da prática de veganwashing.

Palavras-chave: selos verdes; selo vegano; veganismo; greenwashing; veganwashing.

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RESUMEN

Antecedentes: Existen pocos estudios sobre la práctica del veganwashing, entendido como la comunicación engañosa de marketing del valor vegano, una rama del greenwashing. El estudio es un esfuerzo sin precedentes para evaluar el atractivo del vegan consumidor vegano, considerando la posibilidad del veganwashing.

Objetivo: Analizar el impacto de los sellos verdes veganos en la opinión del consumidor, considerando la posibilidad de veganwashing, en términos de evaluación del producto, apreciación del producto como vegano, escepticismo del consumidor, recuerdo del sello y evaluación de la práctica de los sellos verdes.

Método: Se utilizó un enfoque metodológico hipotético-deductivo que se llevó a cabo mediante dos experimentos: primero exploratorio (n=20), con recogida de datos implícita mediante seguimiento ocular; y segundo explicativo (n=147), con recogida de datos autoinformados. En ambos, se compararon tres envases de un producto alimenticio (leche), diferenciando entre la presentación del atractivo: verdadero (SVB), falso (veganwashing) y ausente.

Resultados: El verdadero devolvía una mejor apreciación del producto como vegano, así como un menor escepticismo, corroborando su ventaja competitiva. Sin embargo, esta distinción resultó ser válida sobre todo en ausencia de etiqueta, en lugar del sello, lo que indica la falta de capacidad del consumidor para identificar el *veganwashing* y distinguirlo de las acciones veganas efectivas. Los hábitos alimenticios del consumidor han demostrado ser influyentes en la disminución de esta vulnerabilidad.

Conclusión: Se comprobó la capacidad la etiqueta true vegan para aportar un valor añadido, especialmente en términos de términos de certificación del producto como vegano y de reducción del escepticismo de los consumidores. A pesar de ello, también se señaló que existe una falta de distinción entre el sello, en la medida en que la mera presencia de un sello verde puede generar una reacción positiva, lo que indica la capacidad de influencia en la práctica del veganwashing.

Palabras clave: verde sello; etiquetado vegano; veganismo; greenwashing; veganismo.

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1 INTRODUCTION

The conflicts between society, the economy, and the environment have led to a growth in discussions about sustainability, resulting in the consolidation of social and environmental responsibility in the market, both in terms of organizational performance and from the consumer's perspective (Santos, Coelho & Marques, 2024; Liu et al., 2024). A study published in the Contemporary Journal in 2023 indicates that 45% of consumers prefer companies with social and environmental concerns, and 90% tend to be loyal to socially responsible brands (Paiva et al., 2024). This demonstrates how companies are prioritizing social and environmental responsibility to enhance value and solidify their competitive edge in the market (Paiva et al., 2024; Santos, Coelho & Marques, 2024; Liu et al., 2024).

In response to this, the green market is gaining strength, with the introduction and marketing of so-called green products that are environmentally responsible and ecologically correct (Vieira et al., 2020; Santos, Coelho & Marques, 2024). Despite this, it is important to note that considering an organization or even a product as "green" involves a substantial adaptation of the entire marketing mix in order to align it with more sustainable practices, and not just the mere adaptation of the promotional variable, linked to the communication that is directed at consumers (Andreoli, Minciotti & Batista, 2024).

This agenda has become increasingly notorious due to the proliferation of *greenwashing*, which is understood as misleading marketing communication that emphasizes environmental aspects (Andreoli, Silva & Boiral, 2025). Thus, the term refers to the process of green washing, painting, or lushing given to products, brands, and/or organizations, so that they appear to be environmentally friendly, without necessarily actually being so (Andreoli, Minciotti & Batista, 2024). In simpler terms, *greenwashing* is defined as the misalignment or incongruence between a company's environmental communication and its actual environmental performance (Liu et al., 2024).

In recent years, the concept of greenwashing has been expanded through the development of more specific terms, such as veganwashing (Andreoli, Silva & Boiral, 2025). With the growing concern about sustainability, the animal cause, with its focus on the suffering of living beings, has become part of the scope of ethical consumption, expanding the notion of *greenwashing* (Vieira et al., 2020). In this sense, *veganwashing* denotes the organizational strategy of showing respect for vegan ideals, while, in reality, traditional practices of animal, social, and environmental exploitation prevail (Bertuzzi, 2020; Vieira et al., 2020).

In light of the above, the aim of this study was to analyze the performance of green labels with a vegan appeal to consumers, considering the possibility of *veganwashing*, in terms of product evaluation, appreciation of the product as vegan, consumer skepticism, recall of the label, and evaluation of the practice of green labels. A hypothetical-deductive methodological approach was adopted, carried out through two subsequent experiments: first exploratory (n=20), involving the collection of implicit eye-tracking data, and then explanatory (n=147), with the collection of self-reported data. In both cases, three packages of a food product (milk) were compared, differentiating between the display of the green label of vegan appeal: true (official SVB label), false (*veganwashing*), and absent.

There are several reasons for this study. Despite the growing academic interest in greenwashing, current systematic reviews highlight the need to understand the practice, particularly in relation to the most interested public: the consumer market (Santos, Coelho & Marques, 2024; Liu et al., 2024; Andreoli, Silva & Boiral, 2025). If this is true of greenwashing, an older and relatively more studied term, the natural inference is that it is worse in the case of veganwashing, which still accounts for a scarcity of studies (Andreoli, Silva & Boiral, 2025; Bertuzzi, 2020; Dreist et al., 2025). Furthermore, environmental value certification has become a significant concern regarding these misleading marketing communications, both among academics (Nygaard, 2023) and the market (Jardim, 2025). This is explained by the very purpose of the practice of green and/or vegan labels, which is considered the link between production and consumption in the sustainable sphere (Fan et al., 2022), with the effective capacity to add environmental value to the product (Varshini, 2024). In this sense, the study is positioned as an unprecedented effort to assess the vegan appeal to consumers, considering the possibility of veganwashing, while also undertaking a comprehensive, exploratory, and explanatory approach.

2 THEORETICAL FRAMEWORK

The theoretical background is structured in two sequential subtopics, in which the vegan movement and vegan consumption are discussed first, followed by a discussion of *greenwashing* and *veganwashing* practices.

2.1 Vegan movement and consumption

Based on sustainable motivations, one of the movements that has gained momentum in the last decade is veganism, defined as a philosophy of life that excludes any form of animal exploitation, whether in food consumption, in the manufacture of clothing and accessories, or even for testing cosmetics and beauty products (Salehi et al., 2024; Policarpo, Teodoro & Nakajima, 2024). This movement arose out of a concern for animal welfare and was driven by some efforts,

such as the notable creation of the first organization with this agenda, The Vegan Society, founded by the British Donald Watson in 1944 (Santos, 2023).

The vegan movement is viewed as a lifestyle that extends ethical values to non-human animals and the natural environment (Policarpo, Teodoro, & Nakajima, 2024; Cherry, 2015). In this way, in addition to having a food approach, the movement can also be seen as a political perspective, since food and eating are not restricted to the food itself, but permeate the entire production, marketing, and consumption process (Bertuzzi, 2020). It can be said that food and eating form a complex set of symbols, meanings, and interests, as well as representing different moral and ethical behaviors (Portilho, 2020). Therefore, to say that food has a political character is to consider the complexity of this process, which is constantly being reconfigured, without losing sight of its potential for social and identity transformation, as well as the lifestyles of individuals in different realities (Bertuzzi, 2020). In this way, the vegan movement encompasses the moral, ethical, and aesthetic behaviours of individuals who seek to politicize their food choices, integrating these reflections into their experiences and social interactions.

In this sense, vegan consumers seek animal cruelty-free options in all aspects of their lives, which has driven the growth of a variety of vegan products on the market (Policarpo, Teodoro & Nakajima, 2024). There are also support and encouragement networks within veganism, where people recommend certain products and producers considered suitable for this lifestyle, encouraging new consumers and expanding this niche, which further boosts the market (Santos, 2020). On the other hand, there is also vegan activism, which aims to denounce and reject the purchase of products based on animal exploitation, especially through boycott movements, assuming a strategic aspect in the political actions of individuals in their relationships with consumer markets and brands (Colomé, 2018).

2.2 Greenwashing and veganwashing

Despite the valorization of the green and/or sustainable attribute, many of the supposedly responsible organizational attitudes only represent manifestations, whose real motivations continue to be the fulfillment of their private interests, based on a strictly instrumental rationality (Vinnari & Laine, 2017). What's worse, misleading marketing communication practices are beginning to be reported, with inconsistencies emerging between organizational discourse and practice (Andreoli, Silva, & Boiral, 2025). This includes *greenwashing*, a term used to denote the process of giving a green appearance to products, brands, and/or organizations, making them appear environmentally friendly without necessarily being so (Andreoli, Minciotti, & Batista, 2024). According to Netto, Sobral, Ribeiro, and Soares (2020), *greenwashing* can be understood as the intersection of two opposing organizational behaviors: poor environmental performance, but positive communication about it.

With the growing concern about sustainability, the animal cause, with its focus on the suffering of living beings, has become part of the scope of ethical consumption, expanding the notion of *greenwashing* (Vieira et al., 2020; Dreist et al., 2025). Along these lines, the term *veganwashing* has emerged to denote the organizational strategy of expressing, through products and processes, respect for vegan ideals, while, in reality, traditional practices of animal, human, and environmental exploitation prevail (Bertuzzi et al., 2020).

The practice of *veganwashing* is complex and can be characterized in different ways. It can be configured when a company introduces plant-based alternatives to its line of non-vegan products to raise its profile among compassionate consumers and compete for a slice of the vegan market, without actually reducing its contribution to animal suffering (Hendricks, 2018). It can also be identified when a company uses vegan certification labels, either for animal-free or exploitation/cruelty-free products, but fails to prove the veracity of this claim (Révillion et al., 2020). There are also alleged cases of companies entering the vegan market, in view of its increasing growth, while continuing to operate in other segments that do not align with the movement's ideals (Davidson, 2022).

In this way, the organization's stance is analyzed as a whole, mapping out possible contradictory behaviors from the perspective of veganism principles, which reveal divergences between the intended image and its actual attitudes (Vieira, 2020). Despite this, we must consider the existence of a current of thought known as pragmatic, strategic, or market veganism, which argues that animal exploitation permeates the entire production and marketing chain (Guadagni, 2018). Even so, consumption presents itself as an efficient strategy for changing the attitudes of organizations, and it is feasible for vegans to opt for products with a lower trace of exploitation and that promote fairer trade practices consistent with their principles (Guadagni, 2018). Based on the decision to consume, a stimulus can be promoted for the business model that is to be maintained and replicated (Davidson, 2023).

Certifications generally give greater credibility to the customer, as well as adding value to the product, and can be granted by government bodies, organizations accredited by them, or non-governmental organizations (Policarpo, Teodoro & Nakajima, 2024; Stremmel et al., 2022). Thus, labels guarantee impartial and accurate information about what will be consumed, and are the most reliable method for generating safety and adding value to consumers and organizations, respectively (Stremmel et al., 2022; Ribeiro, 2022).

A survey carried out by IBM in partnership with NFR in 2020 interviewed 19,000 consumers from 28 countries, including Brazil, and revealed that consumers are willing to pay up to 35% more for sustainable products with transparent

origins, and that almost 80% of consumers said it was important for brands to provide guaranteed authenticity, such as certifications (Mendes, 2024). In a similar vein, a survey of 2,700 people conducted by the Ilumeo Institute revealed that products with green labels are featured in the purchases of almost 70% of consumers, with 86% of respondents considering these labels essential (Jardim, 2025).

In academic circles, studies reinforce the growing relevance of green labels in the consumer purchasing decision-making process (Varshini, 2024; Mendes, 2024; Chiesa, Marsico & Souza, 2023; Stremmel *et al*, 2022), either in terms of a better reaction to companies offering environmentally friendly products, or even a willingness to value and pay more for products with verifiable sustainable credentials (Varshini, 2024; Mendes, 2024; Chiesa, Marsico & Souza, 2023; Stremmel et al., 2022). Thus, the practice of green labels is considered to be the link between production and consumption in a sustainable context (Fan et al., 2022), in which an effective capacity to add environmental value to the product is advocated (Varshini, 2024).

In Brazil, the Brazilian Vegetarian Society (SVB) created a vegan label in 2013, through a certification program called "SVB Vegan Product Certificate", which gives products in various categories (food, cosmetics, hygiene, cleaning, and footwear) reliable credibility. The label is recognized by Animal Charity Evaluators, one of the world's most effective non-governmental evaluation organizations. The standards for obtaining the label are based on the European Vegetarian Union (EVU), which stipulate that products must be totally free of any animal exploitation, and must not contain animal ingredients and/or substances derived from them, such as additives, supplements or enzymes, nor be processed using technologies of animal origin, nor make use of animal testing during the manufacturing process.

There are other vegan labels operating in the country to certify products and guarantee their compliance with vegan criteria, but the SVB label stands out for being the most widely used and comprehensive, in addition to its rigorous certification process (SVB, 2023). Among the main labels recognized in the Brazilian market are the Brazilian Vegan Association Label, the V-Label, the FoodChain ID Label, the "I follow this footprint in defense of animals" Label from ANDA (Animal Rights News Agency), and the Vegan Certificate from the Veganismo Brasil Organization. In addition to these, international labels such as the Vegan Society, Leaping Bunny, PETA, and Certified Vegan are also recognized in the country (SVB, 2023).

Souza (2020) examined the influence of labeling on vegan products, including both food and cosmetics, on the purchasing behavior of vegan consumers. The results indicated that the presence of vegan labels on items generates a significant and favorable impact, establishing a verbal connection between the consumer and the product (Souza, 2020). It is interesting to note that this relationship proved consistent regardless of the product category or the degree of affinity the consumer had with the vegan lifestyle (Souza, 2020). The team responsible for certifying the Brazilian Vegetarian Society (SVB) also conducted a survey in 2023, involving vegan, vegetarian, and sympathetic participants, who reported that almost 97% of respondents had already identified the SVB label on products (SVB, 2023). Furthermore, 97% of those who recognized the label reported that it had a positive influence on their purchasing decisions (SVB, 2023). These results highlight the growing relevance of vegan labels as effective tools to guide the choices of conscious consumers, particularly in relation to the label in question, demonstrating a significant impact on product differentiation and consumer confidence in the vegan product market (SVB, 2023).

On the international scene, Stremmel et al. (2022) compared food products with and without the vegan label, finding better performance when the label was present, which resulted in a more positive consumer reaction in terms of appreciation for the product's sustainability, as well as a greater intention to buy. This proved especially valid for consumers who had already adjusted to more flexible eating patterns, especially vegans (Stremmel et al., 2022). More recently, Carneiro-Otto (2024), using a similar procedure, validated the performance of the vegan label in influencing consumers' purchase intentions, eliciting a more positive emotional reaction.

As a result of the previous discussion, it is expected that the true vegan green label will perform better, eliciting a more positive consumer reaction, given its capacity to add value and provide a competitive edge. This performance is expected in relation to the metrics of interest in the study: firstly, the evaluation of the product in general; secondly, the appreciation of the product as vegan, which characterizes its certification power; and thirdly, the reliability of the label, with reduced consumer skepticism.

- H1- Better product evaluation is expected when the real vegan label is present, compared to others (without a label and fake, characterizing *veganwashing*).
- H2- Greater power to certify the product as vegan is expected when the real vegan label is present, compared to the others (no label and fake, characterizing *veganwashing*).
- H3- Less consumer scepticism is expected when the real vegan label is present, compared to the others (no label and fake, characterizing *veganwashing*).

Despite this, there is also the argument that consumers lack knowledge about the practice of green labels, and it is also difficult to distinguish and appreciate the various green labels adopted by the market (Andreoli, Lima & Prearo, 2017). In the study by Andreoli, Lima, and Prearo (2017), fictitious labels that characterized *greenwashing demonstrated* equal or even better performance than a real label, the FSC - Forest Stewardship Council, which is considered a well-established

brand in the market. This proved to be true, particularly for the recall of the green label displayed on a product's packaging (Andreoli, Lima, & Prearo, 2017). Consumers' assessment of the green labels practice, in general, was also influenced by the presence of fake labels (*greenwashing*), showing no difference to the recognized green labels (Andreoli, Lima & Prearo, 2017). In a similar empirical procedure, but within the context of *organic washing*, a more favorable evaluation of the green label practice was also observed when the fake label was exposed, compared to the official organic label (Andreoli, Kano, & Silva, 2023). It should be noted that the practice of fake labels is considered one of the primary indicators of *greenwashing* (Andreoli, Costa, & Prearo, 2022), a logic that is expected to be replicable for *veganwashing*, just as it was for *organic washing*. Thus, it is expected that the presence of a green label, regardless of its nature, contributes to better performance in the eyes of consumers, compared to its absence, in two key metrics: the recall of the label and the evaluation that consumers make of the green label practice.

H4- Greater recall of the label is expected when it is present, regardless of whether it is true or false (*veganwashing*), compared to when it is absent.

H5- Better evaluation of the green labels practice is expected when the label is present, regardless of whether it is true or false (*veganwashing*), compared to when it is absent.

3 METHODOLOGICAL PROCEDURE

As a methodological procedure, a hypothetical-deductive approach was adopted, carried out through two subsequent experiments: the first, of an exploratory nature, involved the collection of implicit eye-tracking data (n=20), followed by an explanatory one (n=147), which included the collection of self-reported data. The development of the study in these two experiments is justified by the importance of understanding the consumer's process of reception, processing, and evaluation in a broader sense, encompassing both implicit and explicit metrics, with both exploratory and explanatory characteristics.

In both cases, three packages of a food product (milk) were compared, but the green label was displayed differently: true (with the official SVB label), false (characterizing *veganwashing*), and absent (control group). The procedure adopted consisted of presenting one of the product versions (Figure 1) and then collecting data from the participants.



Figure 1. Material used Source: Prepared by the authors.

In both cases, the format was between-subject, i.e., each participant had access to only one experimental group, with random distribution between treatments. The samples were also non-probabilistic, chosen for convenience. To determine the sample, in the first experiment (n=20), we conducted an exploratory study with eye monitoring, following the guidelines of Pradeep (2012, p. 23), who argues for a limited number of respondents when using neuroscientific techniques, similar to the 10% typically used in traditional research. For the second explanatory experiment, the sample power test was used, using the G-power program, which validated the (high) statistical power of the sample (n=147) to reliably detect the effect analyzed (F ANOVA test, with power of 0.91, at an average effect size of 0.3 and significance of 5%).

The two experiments were carried out remotely. The first was conducted using the Real Eye platform, which captured the participants' visual behavior by tracking their gaze. This made it possible to carry out an exploratory analysis of the heat maps, which show the areas that captured the respondents' gaze, both in terms of visualizations (faster gazes) and fixations (longer gazes), along with their intensities, including some metrics of interest, such as the first gaze, revisits, duration (average and total time), sum, and proportion.

The second, in turn, was subsidized by the QuestionPro platform. In this case, the data collection instrument was made up of questions relating to the constructs of interest in this study: product evaluation, with four main attributes; appreciation of the product as vegan, with a scale proposed by Cruz and Silva (2022), with five statements; skepticism in relation to vegan appeals, with a scale adapted from Andreoli, Minciotti and Batista (2024); and judgment of the practice of green labels, according to the scale used by Andreoli, Lima and Prearo (2017), with seven statements. All these scales were presented randomly to each participant, who was asked to rate their level of agreement on a 0-10 Likert scale, with 0 indicating "strongly disagree" and 10 indicating "strongly agree." They were also asked to recall their memories of the green label exhibition. Ultimately, the respondents' profiles were analyzed, encompassing questions about dietary patterns, gender expression, age, and monthly personal income, as presented in Table 1.

Table 1

Survey instrument

<u>Evaluation of the product (H1)</u> - It appears to be of excellent quality/It must have a satisfactory cost-benefit ratio/It appears to be healthy/It is environmentally responsible

<u>Evaluation of the product as vegan (H2)</u> - I consider this product vegan/From the ingredients used in production, this product is vegan/This product presents arguments that convince me that it is vegan/This product presents labels that prove that it is vegan/This product seems to be certified as being truly vegan

<u>Skepticism about vegan appeals (H3)</u> - Most vegan appeals on packaging labels are not true/The vegan appeals on packaging are intentionally very exaggerated/Most vegan appeals on packaging are intended to mislead the consumer/I don't believe most environmental appeals on packaging labels

Recall of the green label and forced recall (H4) - Do you remember seeing a label on the product? Which label?

<u>Judging the green labels practice (H5)</u> - Almost everyone knows about the green labels on products/Most consumers understand what these green labels mean/I believe that consumers always notice the green labels on products/Vegan labels are a very reliable certification of organizations' actions/It is impossible to confuse or even deceive consumers with fake vegan labels/I would prefer to buy products that have these green labels instead of buying similar products without these labels/I would be willing to pay a little more for products that have these green labels instead of buying cheaper similar ones without these labels

Respondent profile - dietary pattern, gender expression, age, and average personal income

Source: Prepared by the authors.

Exploratory factor analyses were conducted to validate the scales themselves, following the recommendations of Hair et al. (2009), which enabled the classification of subjects based on the evaluated metrics. Additionally, Cronbach's alpha coefficient was reported to verify reliability and internal consistency. In all four cases, a single factor was indicated, as follows: evaluation of the product, 59.4% of the total variance explained (KMO=0.761 and α =0.744); appreciation of the product as vegan, 72.6% of the total variance explained (KMO=0.821 and α =0.897); skepticism towards vegan appeals, 71.6% of the total variance explained (KMO=0.819 and α =0.864); and judgment of the practice of green labels, 56.8% of the total variance explained (KMO=0.864 and α =0.870). Additionally, various data analysis techniques were employed. Firstly, descriptive statistics are used for analyzing measures such as frequency, mean, and standard deviation. To test the hypotheses raised, the parametric ANOVA technique was adopted, with the Tukey a *posteriori* test, the Chi-square test, and the general linear model (GLM).

4 DATA PRESENTATION AND ANALYSIS

This topic is organized into three parts, with the presentation and analysis of the data from the eye monitoring of the first experiment and the self-reported data of the second experiment, respectively, followed by a discussion of the results.

4.1 Experiment 1 – eye tracking

The sample (n=20) consisted of a majority of women (11), with an average age of 29, ranging from 21 to 59 (SD=9.73). The willingness to migrate to a vegetarian/vegan diet was just above the midpoint (M=3.27, SD=1.66), indicating a sample that was relatively concerned about the study's target issue.

The heatmaps of visualizations (faster focuses) are shown first, followed by fixations (longer focuses), which are of greater interest. The heatmaps allow for a qualitative analysis, with the first (in black and white) illustrating the areas focused on and ignored by the participants, while the second (colored) indicates the intensity of these focuses, which vary from low intensity, when colored green, medium, signaled by the color yellow, to high, when illustrated in red. The results are presented sequentially between the treatments: packaging without a label, packaging with a fake label (characterized as veganwashing), and packaging with a real label (official vegan label, SVB), respectively.

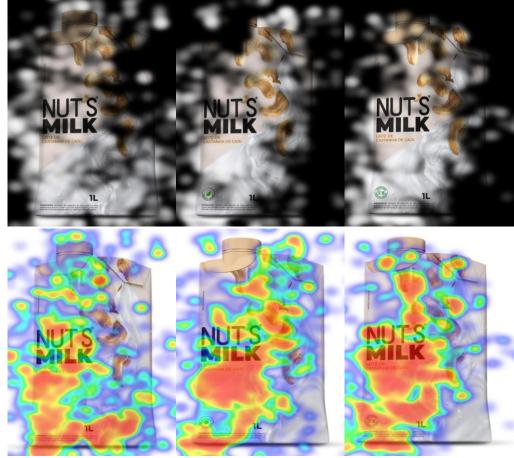


Figure 2. Heat map of visualizations - No label, veganwashing, and SVB Source: Extracted from the Real Eye platform.

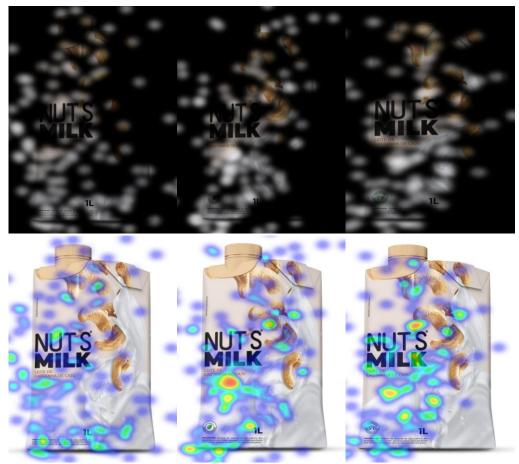


Figure 3. Heat map of fixations - No label, veganwashing, and SVB Source: Extracted from the Real Eye platform.

Although exploratory, some nuances can be mentioned in relation to the differentiation in visual behavior between the three images. When analyzing the views (quicker focuses), it can be seen that they concentrated on the packaging as a whole, focusing on the brand and the product description. In the case of the labels, the real label seemed to have captured views more comprehensively, as a whole, while the fake label accounted for a more partial capture. As for the longer glances, the fixations were more dispersed, with a few points of high fixation (red color), which were more recurrent when the stamps were present, although not directly on them. The medium-intensity fixations were also concentrated on the brand display and product description. Despite this, it should be noted that the stamps did fixate, as the black and white heat map shows, albeit with less intensity.

For a more detailed analysis, two areas of interest (AOI) were selected: the entire package and the label area specifically. This generated various metrics relating to the visual behavior of participants, both in terms of views and fixations, such as the average time elapsed until the first capture, the average duration of captures, the total sum of captures, the average revisits of captures, and the proportion of participants according to the captures identified. This data is shown in Table 2. Analysis of these results showed that the real label took a little longer to receive the first glance, both for viewing and even longer for fixation, but that it lasted longer. Additionally, the total number of views was much higher, approximately three times that of the fake label. The proportion of participants who looked at the real label was also higher, accounting for 100% of views and 60% of fixations (compared to 60% and 40% respectively). This improved performance of the vegan label was corroborated by the attention capture metric, a raw data point reported by the platform, which yielded a positive result, even better than the packaging as a whole, and especially in comparison to the fake label, which returned a negative attention capture (0).

Table 2Eye tracking metrics

	Label			Package		
	No label	False	SVB	No label	False	SVB
First Visualization (Average)	3.4	4.7	5.9	0.2	0.1	0.2
Duration Visualization (Average)	0.3	0.1	0.3	7.6	7.7	8.5
Total Visualization (Sum)	51	19	62	1.670	1.708	1.892
Visualization Laps (Average)	0.4	0	0	4.2	3.4	3.6
Proportion Visualization (%)	80	60	100	100	100	100
First Fixation (Average)	4.3	5.2	8.6	0.5	0.1	0.2
Duration Fixation (Average)	0.2	0.2	0.3	0.2	0.2	0.2
Total Fixation (Sum)	5	2	3	120	135	131
Fixation Laps (Average)	0.4	0	0	4.2	3.4	3.6
Proportion Fixation (%)	40	40	60	100	100	100
Attention Fixation	0.3	-0.5	0.7	0.15	0.2	0.35

Source: Prepared from data extracted from the Real Eye platform.

Legend: Unit of time in seconds. The best results are highlighted in bold.

Lastly, the platform also offers facial coding analysis, which enables the inference of participants' emotional states from their facial movements. The images with the labels generated a greater reaction of surprise from the participants, especially the one with the real label. In addition, the packaging with the real label was responsible for larger and longer-lasting peaks of attention, as well as smaller and longer-lasting peaks of inattention, demonstrating the respondents' greater interest in this display.

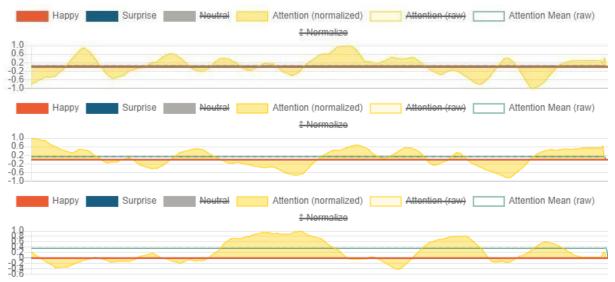


Figure 4. Facial coding – No label, veganwashing, and SVB Source: Extracted from the Real Eye platform.

In addition, the participants' implicit and explicit attitudes were investigated, the former was verified through the free expression of initial associations with the product, and the latter was investigated through the forced recall of the label, as shown in Table 3. The responses were classified into three categories: positive, neutral, or negative, with positive associations reflecting the identification of the vegan attribute, neutral mentions relating to obvious aspects of the product unrelated to the vegan attribute, and negative mentions when there was no identification of this attribute. Thus, the packaging without the label elicited positive associations related to the product being healthy and vegetarian, possibly due to the appreciation of the product description. More interestingly, the packaging with the fake label elicited positive mentions of the product as vegan and vegetarian, particularly in relation to the label, with nearly all respondents having picked up on the vegan, vegetarian, or at least green attribute. The packaging with the real label also elicited positive responses to the product as being healthy, vegan, and vegetarian, anticipating the mention of the label, which was correctly identified by two respondents, although the others did not appear to understand it. These results suggest the ability to differentiate when displaying labels on the packaging, resulting in good evaluations from the respondents, both in terms of the product and the label. It should also be noted that the mere presence of the labels proved to be sufficient, indicating a lack of ability to identify and correctly critically appraise the respondents, given the good performance of the fake label, which was even slightly better than the real one.

Table 3

Implicit and explicit attitudes

First associations			Remembrance of the label		
No label	False	SVB	False	SVB	
Positive: Healthy; Vegetarian	Positive: Vegan(2);	Positive: Healthy(2);	Positive: Vegan(3);	Positive: Brazilian	
Neutral: Milk (3); Cashew nuts;	Vegetarian; Vegetable	Vegan(2); Vegetable	Vegetarian; green	Vegetarian Society/	
White; For intolerants or those	Neutral: Milk(3);	drink; with label	aspect	SVB (2).	
with dietary restrictions;	Flavor; Yogurt;	Neutral: Milk(3), Cashew	Negative: did not	Negative: Didn't identify	
Protein	Supplement;	nuts(2); Lactose(2);	notice	or can't remember (3)	
	Almond	Fitness		` ,	

Source: Prepared from data extracted from the Real Eye platform.

4.2 Experiment 2 - self-declation

The sample (n=147) was evenly distributed between the treatments (true label n=52, false n=51 and control n=44), with the highest recurrence of cisgender female gender expression (58.5%), followed by cisgender male (23.8%) and others, with an average age of 32 years (SD=13.54) and a personal income of approximately R\$7,000 (SD=7,883). The respondents' dietary patterns were concentrated between traditional (33.3%) and sympathetic (36.1%), as well as vegan (6.8%), ovo-vegetarian (4.8%), and vegetarian (3.4%).

Firstly, the data was analyzed unidimensionally. The product evaluation did not yield a statistically significant difference (F=0.192, p=0.826), indicating a lack of differentiation among the respondents and failing to support the study's first hypothesis. Despite this, it should be noted that one assertion on the scale, related to the cost-benefit of the product, proved to be statistically significant (F=3.261, p=0.041), with lower attribution in the case of the true label (M=5.05, SD=2.73), compared mainly to the absence of a label (M=6.43, SD=2.24, p=0.038), and the false label, although in the significance zone (M=5.98, SD=3.02, P=0.080).

The assessment of the product as vegan revealed a statistically significant difference (F=3.518, p=0.032), with a higher attribution of the true label (M=8.52, SD=1.99), compared to the absence of a label (M=7.16, SD=2.65, p=0.024). In this case, the differentiation was partially attested to by the respondents, illustrating the label's certification capacity as a differentiator in consumer appreciation, but only in the absence of the label, partially corroborating the second hypothesis.

Skepticism was close to the statistical significance threshold (F=2.882, p=0.060), with lower attribution in the presence of the true label (M=3.45, SD=2.06), compared to its absence (M=4.69, SD=2.68, p=0.047). In other words, vegan certification elicited a less skeptical reaction from consumers, even when faced with no label at all, providing partial support for the study's third hypothesis.

The respondents' recollection of having seen a label on the packaging reached a statistically significant difference (X=22.521, p<0.000), distinguishing products with labels present, whether true or false, from products without labels. In this sense, the evocations declared by the respondents also showed a statistically significant difference (X=29.832, p<0.000), with a similar result, distinguishing products with labels present, whether true or false, from package without a label. These results confirm the fourth hypothesis of the study, indicating that the mere presence of the green label, regardless of its veracity, appears to be sufficient to convey an image of the product as vegan, with practically equal results between the two.

Finally, there was no statistically significant difference in the judgment of the practice of vegan labels (F=2.019, p=0.137), which does not support the fifth hypothesis. It should also be noted that two statements showed such a difference, referring to consumers' understanding of green labels ("the vast majority of consumers understand what these green labels mean") and the reliability of vegan certification ("vegan labels are a very reliable certification in relation to the actions of

organizations"), both with a lower attribution of the true label compared to the false label. These results are shown in Table 4.

Table 4Summary of results: one-dimensional analysis

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Evaluation	F=0,192, p=0,826	No difference
*Cost-benefit	F=3,261, p=0,041	True, SVB (M=5,05, DP=2,73) < no label (M=6,43, DP=2,24, p=0,038) and false (M=5,98, DP=3,02, p=0,080)
Vegan product	F=3,518, p=0,032	True (M=8,52, DP=1,99) > no label (M=716, DP=2,65, p=0,024)
Vegan labels	F=2,019, p=0,137	No difference
*Understanding	F=2,444, p=0,091	True, SVB (M=7,02, DP=3,36 < false (M=8,37, DP=2,59, p=0,080)
*Trust	F=2,266, p=0,10	True, SVB (M=7,15, DP=2,82) < false (M=8,35, DP=2,68, p=0,091)
Skepticism	F=2,882, p=0,060	True, SVB (M=3,45, DP=2,06) < no label (4,69, DP=2,68, p=0,047)
Remember label	X=22,521, p<0,000	True, SVB (26) and false (22) > no label (4)
Which label	X=29,832, p<0,000	True, SVB (13, 3 SVB and 10 vegan) and no label (14, 1 SVB e 13 vegan) > no label (0)

Source: Prepared by the authors.

In a second step, a multivariate GLM (General Linear Model) was conducted with the four dependent variables and the manipulation factor, returning a general model with statistically significant differences in relation to manipulation (F=3.175, p=0.002), which were presented in the variables of appreciation of the product as vegan (F=3.706, p=0.027) and skepticism (F=2.882, p=0.060, eta squared=0.042 and power=0.556), both with better performance of the real label compared to the absence of a label. This reinforces support for the second and third hypotheses of the study, indicating the certification capacity of the real vegan label, which is capable of eliciting less consumer skepticism. This can be interpreted from two different perspectives, as discussed below: on the positive side, the differentiation of the real label perceived by consumers is reinforced; on the negative side, this difference only occurred in the absence of the label, but not wirh the false label (characterizing *veganwashing*). The results are summarized in Table 5.

Table 5Summary of results GLM analysis

Manipulation (F=3,175, p=0,002, eta squared=0,0090 and power=0,966) Vegan product (F=3,706, p=0,027, eta squared=0,054 and power=0,671) - True, SVB (M=8,54, DP=0,36) > no label (M=7,10, DP=0,38, p=0,007) / Skepticism (F=2,882, p=0,060, eta squared=0,042 and power=0,556) - True, SVB (M=3,45, DP=0,35) < no label (M=4,70, DP=0,37, p=0,018)

Source: Prepared by the authors.

The multivariate GLM (General Linear Model) was repeated with the four dependent variables and the handling factor, inserting the food standard as a fixed variable. Here, it was decided to classify into three categories: restricted diet, grouping vegans, vegetarians, and ovo-vegetarians, as well as flexible and traditional. This analysis yielded a general model with statistically significant differences in relation to manipulation (F=3.000, p=0.003) and dietary pattern (F=3.336, p=0.001), as well as the interaction between the two (F=1.726, p=0.039). The manipulation maintained the result in the assessment of the product as vegan (F=8.626, p<0.000), with a better result for the true vegan label, this time showing significant differences between the three groups. In other words, weighing up the dietary pattern, the true vegan label was able to attest to its certification capacity in full.

A similar result was observed for the intersection of manipulation and dietary pattern (F=4.123, p=0.004), where better attributions were made when the diet was restricted and the real vegan label was present, compared to its absence, especially when the diet was restricted and flexible. This indicates that consumers who have already adjusted their diet are more likely to judge the vegan label, although this effect occurred in the absence of the label, but not in the case of the fake label.

On the other hand, the dietary pattern showed a statistically significant difference in the evaluation of the practice of green labels (F=9.284, p<0.000), with the traditional diet group returning the worst evaluation, compared to the restricted and flexible diet, which demonstrates the convergence of the practice with the most adherent target audience.

Table 6

Summary of results GLM analysis - with dietary pattern

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Manipulation (F=3,000, p=0,003, eta squared=0,096 and power=0,954)

Vegan product (F=8,626, p<0,000, eta squared=0,130 and power=0,965) - True, SVB (M=8,90, DP=0,46) > false (M=7,91, DP=0,35, p=0,05) > no label (M=6,31, DP=0,43, p<0,000)
```

Dietary pattern (F=3,336, p=0,001, eta squared=0,106 and power=0,973)

Vegan labels - (F=9,284, p<0,000, eta squared=0,139 and power=0,975) - Traditional (M=5,14, DP=0,34) < Flexible (M=6,66, DP=0,32, p=0,002) and Restricted (M=7,69, DP=0,57, p<0,007)

Manipulation * dietary pattern (F=1,726, p=0,039, eta squared=0,057 and power=0,935)

Vegan product (F=4,123, p=0,004, eta squared=0,125 and power=0,909) - True, SVB (M=8,54, DP=0,36) > no label (M=7,10, DP=0,38, p=0,007)

Source: Prepared by the authors.

4.3 Discussion of results

In the exploratory stage, eye tracking revealed better performance by the true vegan green label, with improved results in indicators of visualization, fixation, and attention. Despite this, the implicit association test revealed a positive consumer reaction to the presence of the vegan green label, both true and false, suggesting a lack of identification and differentiation capacity among consumers. In other words, the mere presence of a vegan green label, regardless of its veracity, proved capable of influencing the consumer's reaction.

The explanatory stage enabled a deeper examination of the results mentioned above. The performance of the vegan label was not validated in relation to product evaluation (H1). On the contrary, it received the worst evaluation in terms of value for money, suggesting a perception of high prices associated with the vegan market. In fact, the high price of vegan products remains a crucial factor in consumers' purchasing decisions, due to the market's particularities, including lower demand and small-scale production (Mendes, 2022; Keil, 2019). This is even more evident in the food context, where industrialized vegan products are often cited as examples of high-priced items, understood as an exploitation of the expanding vegan market by companies (Keil, 2019).

In contrast, the performance of the vegan label was attested in the appreciation of the product as vegan (H2), but only partially. Full validation occurs when the dietary pattern is taken into account, reinforcing the case for alignment with consumers who have already adjusted their lifestyles towards veganism in some way (Stremmel et al., 2022). Along the same lines, the performance of the vegan label in terms of consumer skepticism was also partial (H3), indicating that it was better than the absence of a label. These results corroborate the competitive differential of the vegan label, with authenticity serving as a testament to the vegan attribute, thereby reducing the perceived risk to the consumer (Souza, 2020; SVB, 2023).

In addition, exposure to the label influenced consumer recall (H4), indicating that the mere presence of a green label makes it easier to associate the product with the vegan concept, regardless of its authenticity. This result can be interpreted from two different perspectives, as will be discussed below. Finally, it was not possible to validate the influence on the evaluation of the practice of vegan labels (H5). In the meantime, only two statements differed, relating to consumers' understanding of green labels and the reliability of vegan certification, both of which had a lower attribution for the true vegan label compared to the false label. In other words, contradictorily, consumers rated their ability to understand and the authenticity of green labels more highly when faced with *veganwashing*. Table 6 summarizes the validation of the hypotheses.

Table 7

Hypotheses	Unidimensional	GLM	GLM 2
H1- Better product evaluation is expected when the real vegan label is present, compared to others (without a label and fake, characterizing <i>veganwashing</i>).	No support	No support	No support
H2- Greater power to certify the product as vegan is expected when the real vegan label is present, compared to the others (no label and fake, characterizing veganwashing).	Partial support (compared to no label)	Partial support (compared to no label)	Support
H3- Less consumer scepticism is expected when the real vegan label is present, compared to the others (no label and fake, characterizing veganwashing).	Partial support (compared to no label)	Partial support (compared to no label)	No support
H4- Greater recall of the label is expected when it is present, regardless of whether it is true or false (<i>veganwashing</i>), compared to when it is absent.	Support	-	-
H5- Better evaluation of the green labels practice is expected when the label is present, regardless of whether it is true or false (<i>veganwashing</i>), compared to when it is absent.	No support	No support	No support

Source: Prepared by the authors.

The results obtained in this study can be analyzed from two different perspectives. From a positive perspective, it was observed that the performance of the true vegan label validates the ability to add value and the competitive edge advocated by the literature and the market (Varshini, 2024; Mendes, 2024; Chiesa, Marsico & Souza, 2023; Stremmel et al., 2022). This highlights not only the importance of green labels in general, but especially vegan labels, such as the SVB, as an essential certification for boosting product marketing and strengthening the vegan market (Mendes, 2024; Chiesa, Marisco, & Souza, 2023; SVB, 2023). According to Leão (2023), in the last three years, the SVB has registered an impressive growth of more than 560% in the volume of certified items, reflecting the increase in the supply of vegan options on the national market. This scenario becomes even more promising considering the more adherent target audience, who have already adjusted their lifestyle towards veganism, in view of the better performance of the true vegan label in front of these consumers (Stremmel et al., 2022).

On the other hand, on the negative side, it should be noted that the differentiation of the true vegan label almost always occurs in comparison to the absence of the label, rather than the presence of the label (*veganwashing*). In some cases, performance was similar for both labels. Thus, it appears that the mere presence of a green label is enough to add

value, regardless of its veracity, a result already noted by previous studies (Andreoli, Lima, & Prearo, 2017; Andreoli, Kano, & Silva, 2023). In fact, the use of allusive figures and the adoption of false certifications are considered sins of *greenwashing*, reflecting the most frequent practices in relation to misleading marketing communication (Andreoli, Costa, & Prearo, 2022). As such, it is argued that consumers lack information and are unable to identify *veganwashing practices* and distinguish them from effective vegan actions (Andreoli, Silva, & Boiral, 2025).

5 FINAL CONSIDERATIONS

This study aimed to analyze the performance of green labels with a vegan appeal among consumers, considering the potential for *veganwashing*. It was possible to attest to the value-added capacity of the true vegan label, particularly in terms of certifying products as vegan and reducing consumer skepticism. Despite this, it was also noted that there is a lack of distinction between true and false labels, as the mere presence of a green label can elicit a positive reaction from consumers, which suggests the influence of *veganwashing*.

The exploratory stage showed that the real vegan label performed better, both in terms of visualization, fixation, and attention. The implicit association test yielded a positive consumer reaction when the label was present, indicating that the mere presence of a green vegan label, whether true or false, can influence consumers's reactions. This was reinforced during the explanatory stage, with respondents recalling the label more accurately when it was present, regardless of its veracity.

The true vegan label returned a better appreciation of the product as vegan, as well as reduced skepticism, corroborating its competitive edge and authenticity to attest to the vegan attribute, thereby reducing the perceived risk to the consumer. Despite this, the distinction proved to be valid mainly in the absence of a label, rather than a fake label, indicating the consumer's inability to identify veganwashing and distinguish it from genuine vegan actions. The dietary pattern had an influence on this, indicating that consumers who have already adjusted their lifestyles in some way towards veganism are more likely to make a judgment.

In this sense, the study makes a theoretical contribution by examining consumer reactions to the practice of misleading marketing communication, specifically veganwashing. Furthermore, empirically, it did so through a broad, hypothetical-deductive procedure with an exploratory and explanatory nature, collecting both implicit and explicit data, thereby adding empirical evidence. It is thus an unprecedented effort to experimentally investigate vegan appeal to consumers, considering the possibility of *veganwashing*.

Its managerial implications include the need for greater awareness on the part of organizations that promote responsible or sustainable discourses, in order to maintain the value-added capacity of such attributes in the market. With vegan appeal on the rise, vegan certification must be able to communicate this value in an authentic and credible way. In this way, the adoption of already recognized vegan labels can facilitate the performance of environmental labelling, acting as a proof mechanism. This choice also helps organizations seeking these certifications to engage in effective compliance, thereby eliminating the possibility of *veganwashing*. The same argument holds true for consumers, who should seek more information about marketing communications in general and vegan certifications specifically. This would help consumers identify genuine vegan actions, differentiating them from potential deceptive practices. At the same time, public policies and/or third-sector organizations need to take action through educational initiatives to help consumers identify reliable certifications and warn them about deceptive market tactics. The absence of an effective regulatory body exacerbates the situation, making it difficult both to punish deceptive practices and to effectively protect consumer rights.

Some limitations inherent to the research should be considered, both in terms of theory and methodology. The research addressed a broad perspective on vegan certification, focusing on an official vegan label. In addition, the materials were developed specifically for this study, with a focus on a food product (milk), as well as the adoption of the SVB label and the creation of a fictitious label to characterize *veganwashing*. In addition, the limitation of using non-probabilistic sampling, selected for convenience, should be emphasized. This aligns with the objective of ensuring internal validity, as it is not possible to link the results obtained to the particularities of the study, and generalization is therefore not feasible.

With this in mind, future studies are encouraged. In general, there is a need for a better understanding of the practice of green labels in the vegan market, examining how vegan certification influences consumer behavior, particularly in the face of the potential for *veganwashing*. In this sense, it is recommended to expand the scope of the research to include new metrics of interest, such as those related to consumer reaction, measuring their decision-making process, and their purchase intention and/or willingness to pay, as well as their profile, considering factors like level of education and demographic region. Other materials should also be investigated, both in terms of the product and the target label.

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