

**A Tale of Two Cookies: The Effect of Vegan Labeling on Willingness to Pay**

Jelle T. Dernison

S2721341

Department of Psychology, University of Groningen

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Group: 12

Supervisor: dr. J.A.M. Heesink

Second evaluator: dr. E.F. Rietzschel

In collaboration with:

C. A. E. van Staveren, S. D. de Lange, A. Reuter, F. Schritt, T. van der Veen

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### **Abstract**

Unexpected-vegan products are products which happen to be vegan by default, but are not in concordance with consumers' prior beliefs or expectations. Disconfirming prior beliefs, by labeling unexpected-vegan products (e.g., chocolate chip cookies) as vegan, may lead to perceptual biases attributable to the halo effect evoked by the vegan label. This experimental study examines whether vegan labeling affects the willingness to pay through monthly income. It was expected that, compared to consumers having a grocery budget below average, consumers having an (above) average grocery budget are willing to pay more for an unexpected-vegan product containing a vegan label, opposed to an unexpected-vegan product without a vegan label. To test the hypotheses, an online survey was distributed by means of a convenience sample ( $N=219$ ). Accordingly, no relationship was found between labeling, monthly income and willingness to pay. However, chocolate chip cookies containing a vegan label were perceived as more environmentally friendly and more sustainable, but not as healthier or less tasty. While the vegan label can be a useful tool for consumers, as it signifies that products are free from animal-derived ingredients, it does not communicate anything about the true environmental friendliness or sustainability. Therefore, adding a vegan label to an unexpected-vegan product cannot be fully recommended, as the vegan label could be misused to make products appear more environmentally friendly or sustainable than they actually are. Future studies are recommended to include more unexpected-vegan products in their experimental setup to replicate the current findings and establish more generalizable results.

*Keywords:* food labeling, halo effect, unexpected-vegan, monthly income, willingness to pay

### **A Tale of Two Cookies: The Effect of Vegan Labeling on Willingness to Pay**

In recent years, vegan and vegetarian diets have gained an ever growing, worldwide popularity (Van der Meer et al., 2023). This resulted in an increasing demand for plant-based products, with the expectancy that the global market for plant-based food sales will increase fivefold by 2030 (Elkin, 2021). To facilitate consumers in their selection process, they may be guided by the vegan label, which signifies that the product's ingredients were not derived from animals, nor that any animal-related components were used during the production process (European Vegetarian Union, 2019; VSMK, 2016).

Given the increased popularity toward plant-based food, manufacturers may be enticed to dive into this trend by adding vegan labels to products which are already vegan, yet do not have a vegan label. For example, manufacturers nowadays may decide to inform consumers about a product's origins by displaying a vegan label on the packaging, even though the product is vegan by default (e.g., jam, peanut butter, humus). Thereby, the manufacturers potentially target an expanding market segment in the food industry. However, whether this labeling practice indeed has a positive effect on consumer behavior has received little to no investigation, especially with regard to price perceptions on purchase intentions. Therefore, this experimental study examines whether vegan labeling affects the willingness to pay through monthly income.

#### **Unexpected-Vegan Products**

Hitherto, the research conducted by Stremmel et al. (2022) is one of the few studies which investigated the effects of labeling different products as vegan. Accordingly, the researchers divided the vegan-labeled products into two categories. Namely, intentionally-vegan products and randomly-vegan products. The former aims to mimic foods of animal origins (e.g., meat substitutes) and is aimed explicitly at the market segment of vegans and vegetarians, whereas the latter is not intentionally produced to substitute animal products (i.e.

has not undergone any special reformulation) and is not particularly aimed at serving the market segment of vegans and vegetarians (Stremmel et al., 2022). Thus, these randomly-vegan products are already vegan by default (see, e.g., PETA, n.d.).

Moreover, randomly-vegan products can be subdivided into the categories expected-vegan and unexpected-vegan. This subdivision is dependent on whether consumers are more likely to rate a randomly-vegan product as vegan or non-vegan (Stremmel et al., 2022, p. 3). For example, Stremmel et al. (2022) stated that it is plausible that products made of dough (e.g., cookies) or containing chocolate are oftentimes associated with animal-based ingredients (e.g., eggs, milk). As a consequence, consumers might assess the entire product category as non-vegan, including the intentionally-vegan and randomly-vegan products. Hence, a product might be vegan by default, yet the broader product category could be perceived as non-vegan by default due to the consumer's prior expectations about the product category.

Thus, consumers hold prior beliefs or expectations about different product categories. For example, ice cream is oftentimes associated with containing dairy products. Therefore, the entire product category ice cream is assessed as non-vegan, despite there being both intentionally-vegan and randomly-vegan alternatives. Consequently, these prior beliefs or expectations about products can either be confirmed when labeling expected-vegan products as vegan, or disconfirmed when labeling unexpected-vegan products as vegan. Accordingly, this (dis)confirmation of prior beliefs is dependent on whether or not the consumer's expectations about the product are met. Subsequently, Stremmel et al. (2022) argued that if the consumer's expectations are not met, consumers will be more inclined to reevaluate their perceptions of product attributes based on the label, making them more prone to perceptual biases. However, these perceptual biases did not occur for expected-vegan products with a vegan label (e.g., humus containing a vegan label), but only occurred when labeling

unexpected-vegan products as vegan (Stremmel et al., 2022, p. 7). Thus, the findings by Stremmel et al. (2022) indicated that perceptual biases only occurred when the consumer's expectations were not met or when their prior beliefs were disconfirmed.

### **Perceptual Biases**

Despite the seemingly beneficial effects of adding a vegan label to a product, such as targeting consumers in an expanding market segment and providing clarity about the product's origins to the consumer, this same label may evoke biases which could bolster undesired effects. As indicated by previous research, packaging elements, such as claims and labels, tempt consumers to draw conclusions about a product's characteristics that are not necessarily subject of the claim or label (Stremmel et al., 2022). This phenomenon is otherwise known as the halo and horn effect (Burton et al., 2015). More specifically, "a halo (horn) effect is a form of cognitive bias where one attribute of an object or person leads to a positive (negative) evaluation of other attributes of the same object or person" (Stremmel et al., 2022, p. 2). These halo and horn effects are, according to Berry and Romero (2021),

grounded in spreading activation theories of semantic memory (Anderson, 1983; Brucks & Mitchell, 1981; Collins & Loftus, 1975), which posit that concepts stored in consumers' memories are activated by information presented (Anderson, 1983; Keller, 1993) and can then bias subsequent evaluations. (p. 3)

For example, Besson et al. (2020) discovered that a health halo was based on the vegetarian label, which induced a lower caloric evaluation of food due to health associations evoked by the label. Similar effects were found for other labels as well, such as low-fat (Wansink & Chandon, 2006), organic (Besson et al., 2019), gluten-free (Prada et al., 2019), and fair-trade labels (Schuldt et al., 2012). Nonetheless, products containing a vegan label may be affected

by both the halo and horn effect and, therefore, evoke different perceptions associated with vegan-labeled products.

For instance, concerning the positive effects related to the halo effect, Stremmel et al. (2022) found that biases toward products with a vegan label resulted in an increase in perceived healthiness, perceived sustainability and, correspondingly, an increase in consumption intentions. Subsequently, due to these perceptual biases consumers have a higher intention to buy an unexpected-vegan product containing a vegan label, as a result of perceiving it as healthier and more sustainable (Stremmel et al., 2022). This increase in purchase intentions designates the effect of the “health halo” evoked by the vegan label. As a consequence, consumers tend to overestimate or overgeneralize the healthfulness of food based on a single package claim (Berry & Romero, 2021, pp. 2-3).

However, regarding the negative effects related to the horn effect, Stremmel et al. (2022) found that expected taste was rated worse once a product was labeled as vegan. In addition, Noguerol et al. (2021) argued that products are categorized and perceived differently, depending on the consumer’s diet type (i.e., vegans, vegetarians, flexitarians and omnivores). For example, omnivores “perceive vegetarian diets as less tasty, more expensive, less familiar, less convenient and less healthful (Noguerol et al., 2021, p. 8). Similarly, Kilian and Hamm (2021) described in their study how different diet types resulted in different associations with vegan products. For example, the researchers discovered that vegans did not criticize the taste of vegan food, in contrast to those who ate meat at least occasionally (Kilian & Hamm, 2021, p. 7). Furthermore, another perception regarding vegan-labeled products is that consumers perceive it as expensive, irrespective of their different diet types (Kilian & Hamm, 2021, p. 13). Nevertheless, despite this perception, Martinelli and De Canio (2022) found that consumers are willing to pay a premium price for vegan products. Similarly,

Nielsen (2015) described how about 79% of the consumers in Europe indicated that they are willing to pay a price premium for food products with health benefits.

### **Willingness to Pay**

The present study will examine consumers' willingness to pay in relation to products with a vegan label. Willingness to pay is defined as "the maximum price a customer is willing to pay for a product or service" (Stobierski, 2020, para. 3). In addition, Martinelli and De Canio (2022) found that willingness to pay a premium price is a direct driver of the intention to buy vegan products. According to Mikulić (2021), trends of willingness to pay indicate that consumers are ready to pay more for vegan products. Moreover, consumers might even doubt the quality if a vegan product was priced the same as the conventional one. Correspondingly, Martinelli and De Canio (2022) argued that non-vegans are willing to pay a premium price to purchase vegan food, as these consumers are willing to spend more for ethical and sustainable products. Furthermore, 73% of all plant-based products are purchased by omnivores and flexitarians (ProVeg, 2022b). Accordingly, flexitarians encompass the largest group of the Dutch population with 48%, followed by vegetarians with 5%, and vegans with 2%. Notably, in the age group 18 to 29 years old, there are two and a half times as many vegetarians (12%) and vegans (5%) (Den Hollander, 2022).

Notwithstanding, the willingness to pay can vary significantly per customer and is affected by several factors, such as extrinsic and intrinsic differences between customers (Stobierski, 2020). For example, socio-demographic characteristics (i.e., age, gender, income, education, residence), customer characteristics (e.g., biospheric values, health consciousness, dietary identity), and product characteristics (e.g., legality, packaging, brand name) could all affect willingness to pay (Nicolau et al., 2020; Stobierski, 2020). Nonetheless, although many of the aforementioned factors could affect willingness to pay, for the sake of convenience the present study will focus solely on the effect of monthly income on the willingness to pay. To

elucidate, it was expected that this factor is highly influential when examining this particular consumer behavior. Especially, by considering that price perceptions are subjective (Kagan, 2021). Hence, monthly income could be a potential barrier for some consumers.

### **Monthly Income**

In line with previous research on income and consumer behavior, Zachary et al. (2013) found that “for low-income people, external constraints exert more control over decisions than they do for those with more flexible resources” (p. 11). Likewise, French et al. (2019) established a link between household income and consumer behavior. For example, “lower income households purchase foods of lower nutritional quality compared to higher income households” (French et al., 2019, p. 6). An explanation for this discrepancy in purchasing behavior is that, in the Netherlands, healthier foods have increased more in price than unhealthy foods over the past decade (NOS, 2021). In addition, according to a poll conducted by ProVeg (2022a), 55% of the respondents indicated that pricing was the main reason for not choosing plant-based, despite the fact that the price gap between plant-based and animal-based products is getting smaller.

Furthermore, ProVeg (2022a) compared plant-based and animal-based versions of 32 different product types in six supermarkets in the Netherlands (i.e., AH, Jumbo, Lidl, Aldi, Plus and Dirk). Thereby, the researchers compared the price differences between 100 grams of the cheapest plant-based versions and animal-based versions. In addition, the cheapest plant-based versions were compared to the most expensive animal-based versions to examine if the plant-based products were at least within the price range of the animal-based versions. Accordingly, in 20% of the cases the plant-based versions turned out to be cheaper than the cheapest animal-based versions. Subsequently, 33% of the plant-based versions were classified as ‘affordable’, indicating that the cheapest plant-based versions were more expensive than the cheapest animal-based versions, yet the price was within the price range of



the available animal-based versions. Lastly, the remaining 47% of the cheapest plant-based versions turned out to be more expensive than the most expensive animal-based versions, exceeding the animal-based price range (ProVeg, 2022a).

Notwithstanding these seemingly large differences, ProVeg (2022a) compared a shopping basket of around 25 euros in six different supermarkets in the Netherlands, containing the cheapest versions of the 12 most common plant-based products. Accordingly, these products turned out to be in a relatively similar price range compared to the non-vegan versions. A shopping basket was slightly more expensive at four supermarkets (i.e., Lidl, Dirk, AH, Jumbo), with the largest difference being 75 cents, and slightly cheaper at two supermarkets (i.e., Plus, Aldi), saving 58 cents. These results imply that plant-based products are not per definition more expensive than animal-based products (ProVeg, 2022a). However, even though differences in pricing can be relatively small, vegan products are still perceived as more expensive than their non-vegan counterparts (Kilian & Hamm, 2021).

Nonetheless, pricing is not necessarily problematic, considering that consumers are willing to pay a premium price for vegan products (Martinelli & De Canio, 2022; Mikulić, 2021). Therefore, it is expected that monthly income has a moderating effect on the willingness to pay for vegan products, besides having a main effect on willingness to pay in general. To examine these effects, the monthly income spend on groceries, defined as the monthly grocery budget, is addressed. According to Nibud (National Institute for Budget Information), monthly grocery budget is dependent on family composition. Specifically, household size, gender, age, children (and their age), whether someone is pregnant and/or breastfeeding (Nibud, 2022). Subsequently, the numbers provided by Nibud allow for comparing different grocery budgets with one another. Correspondingly, a grocery budget can be defined as below average, average, or above average, while taking into account the family composition when making comparisons.

**Present Research and Relevance**

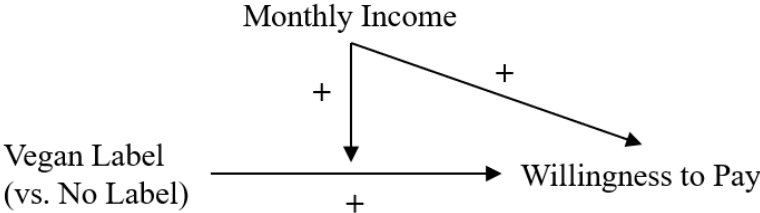
The aim of the present study is to contribute to the existing literature concerning the effects of vegan labeling on product perceptions by gaining more insight in this process. Noteworthy, Stremmel et al. (2022) stated that no previous study has investigated the labeling practice in relation to unexpected-vegan products. Furthermore, the researchers recommended future studies to include price in their experimental set-up, as this could increase the external validity and was an important factor not considered in their study. Therefore, the effects of vegan labeling on unexpected-vegan products are scrutinized in this paper. In particular, by focusing on the willingness to pay with regard to monthly income (see Figure 1). Thereby, examining a largely unconsidered product category. Specifically, this effect was investigated by using vegan chocolate chip cookies as the unexpected-vegan product. Since, it was expected that consumers will assess the entire product category of this product as non-vegan, considering that products made of dough or chocolate are oftentimes associated with containing animal-based ingredients (Stremmel et al., 2022, p. 3).

Accordingly, the following research question is central to this paper: How does monthly income influence the effect of vegan labeling on willingness to pay? In light of this research question the following hypotheses were formulated:

*H<sub>1</sub>*: Consumers have a higher willingness to pay for an unexpected-vegan product containing a vegan label, opposed to an unexpected-vegan product without a vegan label.

**Figure 1**

*Conceptual Model*



*H*<sub>2</sub>: Consumers having an average or above average grocery budget have a higher willingness to pay compared to consumers having a grocery budget below average.

*H*<sub>3</sub>: Compared to consumers having a grocery budget below average, consumers having an average or above average grocery budget are willing to pay more for an unexpected-vegan product containing a vegan label, opposed to an unexpected-vegan product without a vegan label.

To elaborate, these hypotheses imply that only consumers with a grocery budget below average are not willing to pay more for unexpected-vegan products containing a vegan label. This seemed plausible as it was expected that grocery budget could be a potential barrier to making a purchase. Especially, when considering the bias that vegan products are perceived as more expensive (Kilian & Hamm, 2021). Conversely, it was expected that consumers with an average or above average grocery budget are willing to pay more for an unexpected-vegan product containing a vegan label, considering that these consumers are less likely to be inhibited in their purchasing behavior due to their grocery budget. In addition, it was anticipated that willingness to pay for an unexpected-vegan product with a vegan label is affected by the health halo evoked by the vegan label (Besson et al., 2020; Berry & Romero, 2021). Consequently, this could lead to the perception of the product being healthier or more sustainable (Stremmel et al., 2022), which might increase the likelihood that consumers are willing to pay a premium price for the unexpected-vegan product (Martinelli & De Canio, 2022; Mikulić, 2021). Moreover, this effect is expected to be most salient in relation to monthly income, as differences in income resulted in significant differences in consumer behavior (Zachary et al., 2013; French et al., 2019).

## Method

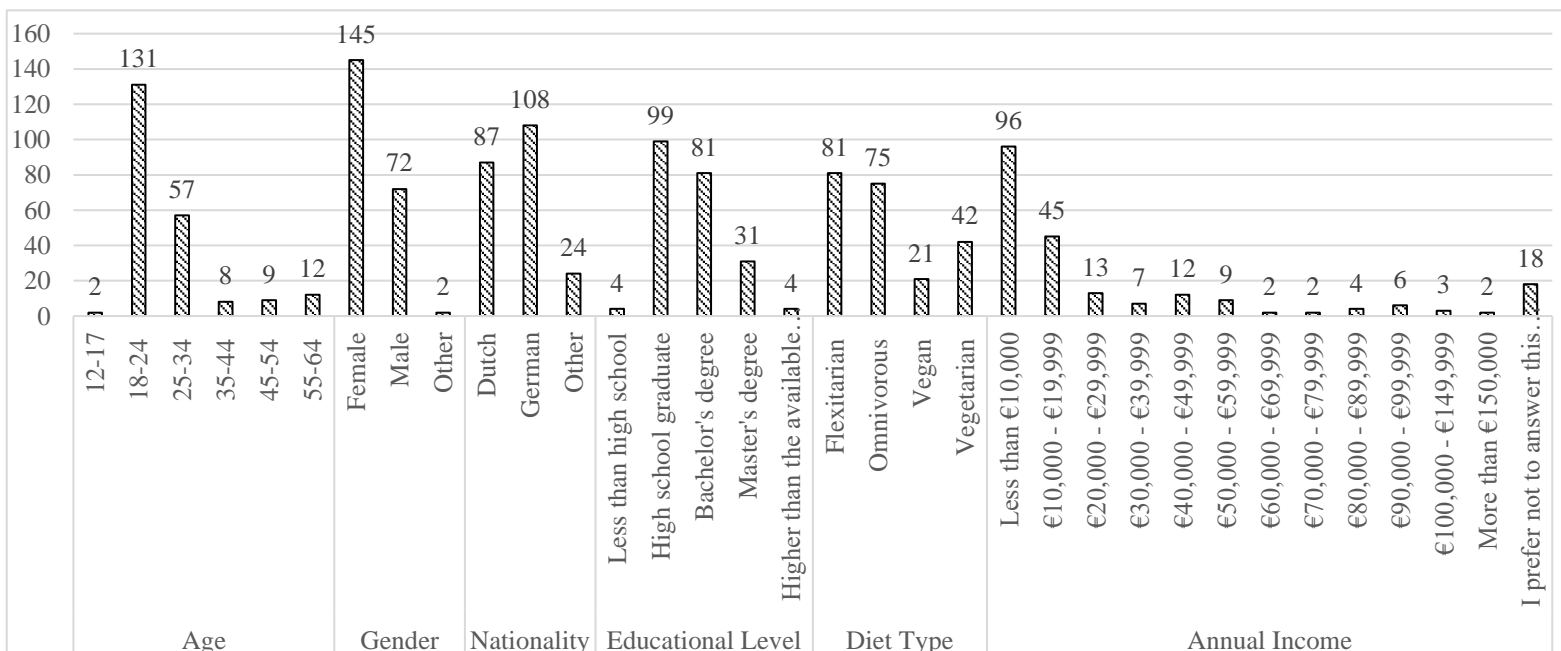
### Participants

For this study a convenience sample was used, consisting mostly of the researchers' acquaintances. The researchers are third year psychology students from the University of Groningen. In total, the online questionnaire received 476 responses, of which 240 participants completed the entire questionnaire. Furthermore, 21 participants failed two out of three attention check questions. According to Paas and Morren (2018), reduced participant attention levels systematically bias responses. Therefore, these participants were excluded from the sample, leaving a total of 219 valid responses for the data analysis (see Figure 2).

The age of participants varied from 16 to 63, with a mean age of 26.85 ( $SD=10.36$ ). Of the participants ( $N=219$ ), 32.9% identified as male ( $N=72$ ), 66.2% identified as female ( $N=145$ ), and 0.9% ( $N=2$ ) identified as other. Participants' nationality varied, with 39.7% of the participants having a Dutch nationality ( $N=87$ ), 49.3% of the participants having a German nationality ( $N=108$ ), and 11% of the participants indicated that they have a different

**Figure 2**

### Sample Demographics



nationality ( $N=24$ ) (e.g., British, Spanish). Regarding educational level, 1.8% of the participants ( $N=4$ ) indicated they completed less than high school, followed by 45.2% of the participants ( $N=99$ ) indicating they were high school graduates, 37% of the participants ( $N=81$ ) completed a bachelor's degree, 14.2% of the participants ( $N=31$ ) completed a master's degree, and lastly, 1.8% of the participants ( $N=4$ ) selected higher than the available options.

Further, participants indicated their diet types, with 9.6% of the participants ( $N=21$ ) indicating that they considered themselves vegan, 19.2% of the participants ( $N=42$ ) indicated that they considered themselves vegetarian, 37% of the participants ( $N=81$ ) considered themselves flexitarian, and 34.2% of the participants ( $N=75$ ) considered themselves as omnivorous. In addition, participants indicated their annual income. Thereafter, participants could be divided into three income categories. First of all, 43.8% of the participants ( $N=96$ ) constitute the below average income group, as they indicated that their annual income is less than €10.000. Secondly, 29.7% of the participants ( $N=65$ ) comprise the average income group, by indicating that their annual income is between €10.000 to €39.999. Thirdly, 18.3% of the participants ( $N=40$ ) encompass the above average group, since these participants indicated that their annual income is €40.000 or higher. Lastly, 8.2% of the participants ( $N=18$ ) indicated that they preferred not to answer this question.

### **Study Design**

For this experimental study, a 2 (label condition: label vs. no label) x 3 (income variable: below average, average, above average) between-subjects design was performed. Participants were randomly assigned to one of the four experimental conditions (see Appendix). Specifically, 53.9% of the participants ( $N=118$ ) were in the label condition vs. 46.1% of the participants ( $N=101$ ) in the no label condition. The division of participants among the three income categories was dependent on their annual income as an objective measure. However, in case participants indicated that they preferred not to answer this

question, their demographics (e.g., age, educational level) and the percentage of their monthly income spend on groceries were assessed to estimate their income category. Correspondingly, this resulted in a distribution of 50.2% of the participants ( $N=110$ ) in the below average income category, followed by 31.5% of the participants ( $N=69$ ) in the average income category and, lastly, 18.3% of the participants ( $N=40$ ) are in the above average income category.

## **Materials**

### ***Manipulation Checks***

To measure if the manipulation was interpreted as intended, four items served as manipulation checks. These items were adopted from Stremmel et al. (2022) to assess the effectiveness of the labeling practice in the experimental design as follows: "Compared to other chocolate chip cookies, I think the chocolate chip cookies that were shown to me are healthier."; "Compared to other chocolate chip cookies, I think the chocolate chip cookies that were shown to me are more tasty."; "Compared to other chocolate chip cookies, I think the chocolate chip cookies that were shown to me are environmentally friendly."; "Compared to other chocolate chip cookies, I think the chocolate chip cookies that were shown to me are sustainable.". The statements were answered on a 7-point Likert scale (1 = *strongly disagree* to 7 = *strongly agree*).

### ***Attention Checks***

Throughout the questionnaire, three attention check questions were incorporated in which the participants had to select a specific answer option. The purpose of these attention check questions is to identify careless respondents and allow researchers to screen them out prior to conducting analyses (Kung et al., 2018, p. 265). Failing at least two out of three attention checks would lead to exclusion from the data analysis, since respondent inattentiveness systematically biases questionnaire responses (Paas & Morren, 2018).

### ***Willingness to Pay***

To assess the participants' willingness to pay, a questionnaire based on Martinelli and De Canio's (2022) measurement scale "Willingness to pay a Premium Price for Vegan Foods" (p. 21) was used. This scale consisted of four items and included items such as: "I am willing to pay more for the chocolate chip cookies that were shown to me, even when a cheaper alternative is available."; "In general, I would choose the chocolate chip cookies that were shown to me even if they cost more than others."; "I make every effort to purchase the chocolate chip cookies that were shown to me."; "No matter their cost, I would buy the chocolate chip cookies that were shown to me whenever possible." The Cronbach's alpha for this scale was  $\alpha=.928$ . Responses were given on a 7-point Likert scale (1 = *strongly disagree* to 7 = *strongly agree*). In addition, willingness to pay was assessed by using the following question as a direct measure: "How much are you willing to pay for the chocolate chip cookies that were shown to you?" Participants had to answer this question by using a slider scale (0,00 euro to 5,00 euro) to indicate the maximum amount of money they are willing to pay for the product.

### ***Monthly Income***

To assess monthly income, participants had to answer two questions about their household composition. First, participants had to indicate for how many persons they provided groceries. Thereafter, participants had to specify their family composition further by selecting one of the available options which best described their household members. Subsequently, based on the data provided by Nibud (2022), an average monthly grocery budget was displayed to the participants, which took into account the household composition which the participant provided. Subsequently, participants had to indicate whether their average monthly grocery budget was different from, or similar to, the grocery budget provided by Nibud by answering the following question: "Compared to the average monthly

grocery budget as indicated by Nibud, my monthly grocery budget is on average...” This statement was answered on a 7-point Likert scale (1 = *much lower* to 7 = *much higher*). After that, participants had to indicate their level of yearly income, followed by a slider scale question (0 percent to 100 percent) about how much percent of their income they spend on groceries per month. Lastly, monthly income was measured by statements such as: “My grocery budget is sufficient to purchase all the items I need.”; “My grocery budget is sufficient to purchase all the items I want.”; “I never have problems with my grocery budget.”; and, “At the end of the month, I still have money left in my grocery budget.” These four statements were answered on a 7-point Likert scale (1 = *strongly disagree* to 7 = *strongly agree*) and resulted in a Cronbach’s alpha of  $\alpha=.819$ . These statements were used to investigate whether there is a difference in willingness to pay between the participants’ income as an objective measure and the participants’ evaluative experience of their income as a subjective measure.

## **Procedure**

Data was collected from 22 November until 1 December 2022. The questionnaire was provided in English only and it took participants around 15 minutes to complete. Participants were evenly distributed over four experimental conditions. The data was collected within one session and no compensation was provided to the participants. The experiment has been approved by the Ethics Committee of Psychology at the University of Groningen.

The role of the researcher in the session was to send the online questionnaire to the participants, without having an active role during the experiment. Participants first read an information section regarding the research purpose, what was being asked of them, which consequences participation could have, how their data was assessed, and what their rights were. After filling out the informed consent, the participants went on to do the experimental task, consisting of looking at an image of one of the four different product designs (see



Appendix). Thereafter, participants had to rate different statements aimed at measuring the manipulation check, intention to buy, willingness to pay, monthly income, health consciousness, biospheric values, and masculinity. However, to clarify, this paper focuses solely on willingness to pay and monthly income. To round off the questionnaire, an attention check was performed. The attention check consisted of a question whether the participants filled out the questionnaire truthfully. Furthermore, three attention check questions were incorporated in the questionnaire in which participants had to select a specific answer option. In closing, participants filled out their demographics.

## Results

The data was analyzed by using SPSS Version 27. All the assumptions required for the analyses were met.

### Manipulation Checks

The manipulation check questions were analyzed by using an independent samples *t*-test, to compare perceived healthiness, perceived tastiness, perceived environmentally friendliness, and perceived sustainability between the label ( $N=101$ ) and no label ( $N=118$ ) conditions. Accordingly, there was a significant difference in perceived environmentally friendliness between the label ( $M=4.23$ ,  $SD=1.63$ ) and no label ( $M=3.48$ ,  $SD=1.53$ ) conditions;  $t(217)=3.51$ ,  $p=.001$ . Furthermore, there was a significant difference in perceived sustainability between the label ( $M=4.24$ ,  $SD=1.65$ ) and no label ( $M=3.37$ ,  $SD=1.35$ ) conditions;  $t(217)=4.24$ ,  $p < .001$ . However, there was not a significant difference in perceived healthiness between the label ( $M=3.46$ ,  $SD=1.47$ ) and no label ( $M=3.35$ ,  $SD=1.35$ ) conditions;  $t(217)=0.58$ ,  $p=.563$ . Similarly, there was not a significant difference in perceived tastiness for the label ( $M=3.58$ ,  $SD=1.31$ ) and no label ( $M=3.32$ ,  $SD=1.22$ ) conditions;  $t(217)=1.56$ ,  $p=.12$ . These results suggest that the chocolate chip cookies containing a vegan label are not perceived as healthier or as less tasty. However, chocolate chip cookies containing a vegan

label are perceived as more environmentally friendly and more sustainable, in contrast to the same product without a vegan label.

### **Willingness to Pay**

To test the hypothesis, “compared to consumers having a grocery budget below average, consumers having an average or above average grocery budget are willing to pay more for an unexpected-vegan product containing a vegan label, opposed to an unexpected-vegan product without a vegan label”, a chi-square analysis was conducted to examine the relationship between labeling and income (see Table 1 for descriptive statistics). Accordingly, no significant effect was found between labeling and income  $\chi^2(2)=0.03$ ,  $p=.988$ . These results suggest that consumers do not have a higher willingness to pay for an unexpected-vegan product containing a vegan label, nor that willingness to pay is affected by monthly income.

Furthermore, an independent samples t-test was conducted to compare the maximum amount the participants are willing to pay (in euros) for the chocolate chip cookies that were shown to them during the experiment. Three participants were excluded during the analysis as outliers, since they indicated not willing to pay anything for the chocolate chip cookies. Accordingly, there was not a significant difference in the amount the participants ( $N=216$ ) are willing to pay between the label ( $M=2.37$ ,  $SD=0.71$ ) and no label ( $M=2.31$ ,  $SD=0.73$ )

**Table 1**

*Sample Sizes, Means, and Standard Deviations of each Variable on the Willingness to Pay*

Labeling	N	Mean	Std. Deviation
No Label	101	2,77	1,15
Label	118	2,78	1,15
<b>Income</b>			
Below Average	110	2,81	1,12
Average	69	2,61	1,08
Above Average	40	2,96	1,34

conditions;  $t(214)=-0.58, p=.566$ . These results suggest that participants are not willing to pay more for chocolate chip cookies containing a vegan label.

Subsequently, the participants ( $N=216$ ) were divided into three categories with regard to their monthly income. This division among categories was dependent on the participants' annual income as an objective measure. However, 18 participants indicated that they preferred not to answer the question concerning their income. For these participants, their income category was estimated based on their demographics (e.g., age, educational level) and the percentage of their monthly income spend on groceries. This resulted in the following categories concerning grocery budget: below average ( $N=108$ ), average ( $N=68$ ), and above average ( $N=40$ ). A one-way between subjects analysis of variance was conducted to compare the effect of monthly income on willingness to pay between the below average, average, and above average conditions. Accordingly, no significant differences were found in willingness to pay for the three conditions of monthly income  $F(2, 213)=1.38, p=.253, \eta^2=.013$ . These results suggest that there is no difference between the income categories of the participants in relation to the amount they are willing to pay for the chocolate chip cookies.

Thereafter, a 2 (label vs. no label) x 3 (below average vs. average vs. above average) between subjects analysis of variance was conducted to analyze the effect of labeling and income on the willingness to pay (see Table 2). Accordingly, the overall model was not statistically significant,  $R^2=.017, F(5, 213)=0.40, p=.608$ . Likewise, the main effect analysis indicated that labeling did not have a statistically significant effect on willingness to pay  $F(1, 213)=0.10, p=.747, \eta^2<.001$ . Similarly, the main effect analysis of income on willingness to pay did not have a statistically significant effect  $F(2, 213)=1.13, p=.325, \eta^2=.010$ . Also, the interaction effect between labeling and income was not statistically significant  $F(2, 213)=0.54, p=.583, \eta^2=.005$ . These results suggest that neither labeling nor income, nor the interaction between these two variables, affects the willingness to pay. Thus, participants are

**Table 2***Average Willingness to Pay of Participants among Conditions*

	Condition	Income	Mean	Std. Deviation	N
Willingness to Pay	No Label	Below Average	2,83	1,17	51
		Average	2,68	1,09	32
		Above Average	2,78	1,27	18
		Total	2,77	1,15	101
	Label	Below Average	2,79	1,07	59
		Average	2,55	1,09	37
		Above Average	3,11	1,41	22
		Total	2,78	1,15	118
	Total	Below Average	2,81	1,12	110
		Average	2,61	1,08	69
		Above Average	2,96	1,34	40
		Total	2,78	1,15	219

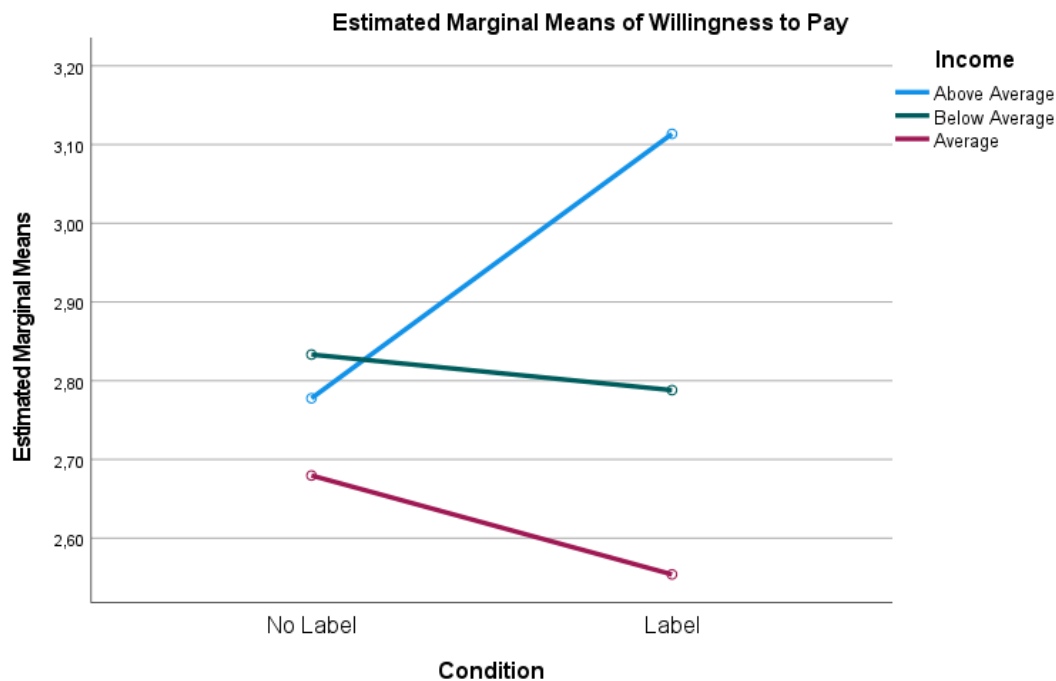
not willing to pay more for chocolate chip cookies containing a vegan label, nor does income affect the willingness to pay.

### Hypotheses

The main effect hypothesis,  $H_1$ : “Consumers have a higher willingness to pay for an unexpected-vegan product containing a vegan label, opposed to an unexpected-vegan product without a vegan label”; the main effect hypothesis,  $H_2$ : “Consumers having an average or above average grocery budget have a higher willingness to pay compared to consumers having a grocery budget below average.”; and, the interaction hypothesis,  $H_3$ : “Compared to consumers having a grocery budget below average, consumers having an average or above average grocery budget are willing to pay more for an unexpected-vegan product containing a vegan label, opposed to an unexpected-vegan product without a vegan label.”, were not supported.

**Figure 3**

*Interaction Plot of Labeling and Income on Willingness to Pay*



Accordingly, no significant differences were found in the willingness to pay between the label and no label conditions. Similarly, differences in willingness to pay did not vary significantly between the label and no label conditions when looking at the maximum amount of money participants are willing to pay, based on the slider scale question, as a direct measure. To illustrate, on average only a difference of ~10 cents was found between the below average and the above average grocery budgets, with the average grocery budgets being somewhere in the middle of that. Thus, these differences of the direct measure of willingness to pay are marginal and, therefore, negligible. Moreover, when looking at the measurement scale of willingness to pay, in contrast to what was hypothesized participants with an average grocery budget have the lowest willingness to pay. In addition, participants with a below or above average grocery budget both have a higher willingness to pay, with the highest willingness to pay for the chocolate chip cookies with a vegan label for participants in

the above average category (see Figure 3). However, none of these differences between the conditions were significant.

### **Exploratory Analysis**

A multiple regression analysis was conducted to investigate whether willingness to pay is moderated by subjective income, based on the participants' evaluative experience of their income (e.g., having a low income but not perceiving it as problematic or vice versa). Accordingly, the overall model was not statistically significant,  $R^2=.004$ ,  $F(3, 215)=0.32$ ,  $p=.814$ . The coefficient for labeling was  $-0.01$ ,  $SE=0.16$ ,  $t(216)=-0.03$ ,  $p=.980$ . The coefficient for subjective income was  $0.05$ ,  $SE=0.08$ ,  $t(216)=0.59$ ,  $p=.556$ . The coefficient for the interaction between labeling and subjective income was  $0.01$ ,  $SE=0.12$ ,  $t(216)=0.12$ ,  $p=.904$ . These results suggest that there is no significant relationship between labeling, subjective income, nor the interaction of labeling and subjective income on the willingness to pay. Thus, how the participants experience or evaluate their income does not affect the willingness to pay for (vegan) chocolate chip cookies

### **Discussion**

The present study contributes to the existing literature by examining the effects of vegan labeling of the largely unconsidered category of unexpected-vegan products. Furthermore, the present study is one of the first to consider the effects of potential moderators, such as monthly income or grocery budget, on the willingness to pay with regard to unexpected-vegan products. The purpose of this study was to gain better understanding of the influence of vegan labels on willingness to pay and how this may be affected by monthly income.

In contrast to Stremmel et al. (2022), the perceptual biases with regard to perceived healthiness and perceived tastiness were not replicated in the present study. However, the

present study did replicate the findings that unexpected-vegan products (i.e., chocolate chip cookies) containing a vegan label are perceived as more environmentally friendly and more sustainable. Thereby, partly supporting the literature on the halo effect (e.g., Burton et al., 2015; Wansink & Chandon, 2006; Berry & Romero, 2021). Noteworthy, if a halo effect indeed occurred, this would probably have resulted in a higher willingness to pay for the unexpected-vegan product containing a vegan label, which was not the case in the present study.

This discrepancy found in the perceptual biases, as compared to Stremmel et al. (2022), could be explained by differentiating between food types. Namely, chocolate chip cookies are a hedonic product, which implies that it is linked to short-term goals such as “pleasure and immediate gratification” (Stremmel et al., 2022, p. 3), and does not serve a functional purpose such as utilitarian food products, which is linked to long-term goals like “staying healthy” (Stremmel et al., 2022, p. 3). As was indicated by previous research, consumers are willing to pay a premium for products with health benefits (e.g., Nielsen, 2015; Berry & Romero, 2021; Mikulić, 2021; Martinelli & De Canio, 2022). However, health benefits are more likely to apply to utilitarian products instead of hedonic products. This was corroborated by Loebnitz and Grunert (2018), as they argued that “consumers value taste as the most important benefit for hedonic food but performance as a key benefit for utilitarian food” (p. 229). Thus, consumers pursue different motives with different food types. Moreover, this implies that hedonic products containing a vegan label are not, by definition, perceived as healthier or as less tasty, as was supported by the present findings. Furthermore, if consumers would want to purchase a healthy product, they would probably choose a healthier option (e.g., granola bars) than chocolate chip cookies, or they might not purchase cookies in the first place.

In light of the hypotheses, the first main effect hypothesis,  $H_1$ : “Consumers have a higher willingness to pay for an unexpected-vegan product containing a vegan label, opposed to an unexpected-vegan product without a vegan label”, was not supported. Despite previous findings, such as the perception that vegan-labeled products are expensive (Kilian & Hamm, 2021), or the willingness to pay a premium for vegan products (Martinelli & De Canio, 2022), no differences were found in the willingness to pay between the label conditions. Thereby, rejecting  $H_1$ .

Subsequently, the second main effect hypothesis,  $H_2$ : “Consumers having an average or above average grocery budget have a higher willingness to pay compared to consumers having a grocery budget below average.”, was not supported. Previous research on consumer behavior suggested that income could affect purchase behavior (e.g., Zachary et al., 2013; French et al., 2019). However, no significant differences in willingness to pay were found in relation to monthly income, nor were any significant differences found when considering the subjective evaluation of income. Furthermore, when looking at the maximum amount of money participants were willing to pay, the largest difference found between the income groups was less than 10 cents. Thereby, rejecting  $H_2$ .

Lastly, concerning the third hypothesis, the interaction hypothesis,  $H_3$ : “Compared to consumers having a grocery budget below average, consumers having an average or above average grocery budget are willing to pay more for an unexpected-vegan product containing a vegan label, opposed to an unexpected-vegan product without a vegan label.”, was not supported. An explanation for this finding might be that consumers are only willing to pay a premium for products with health benefits, as was pointed out by previous research (e.g., Nielsen, 2015; Berry & Romero, 2021; Mikulić, 2021; Martinelli & De Canio, 2022). Since health benefits were clearly lacking in the case of chocolate chip cookies, and considering that



especially healthier foods are more expensive than less healthy foods (NOS, 2021), this might have affected the willingness to pay. Thereby, rejecting  $H_3$ .

Another explanation for why the hypotheses were not supported could be due to the composition of the sample. Specifically, the sample was relatively young, well-educated and most participants had a low income, which is indicative of students. Considering the likelihood that predominantly students participated in the survey, this could potentially affect the results. Especially, when taking into account that critical thinking is considered as one of the most important indicators of student learning quality (Alsaleh, 2020). Therefore, it might be possible that these participants were more likely to critically analyze the actual characteristics of the unexpected-vegan product and, as a consequence, were less affected by perceptual biases evoked by the halo effect of the vegan label. Subsequently, this could influence the willingness to pay. Taken altogether, with regard to the perceptual biases, consumers do perceive vegan-labeled chocolate chip cookies as more environmentally friendly and more sustainable, but not as healthier or as less tasty.

### **Limitations and Future Research**

The present study had three main limitations. The first limitation is that data was collected by means of a convenience sample. Therefore, our sample composition consisted mostly of WEIRD participants (i.e., White, Educated, Industrialized, Rich, Democratic). Consequently, this could affect the external validity of the findings, as the sample was relatively young, predominantly female, college-educated, and most respondent had a low income which is indicative of students. Therefore, it is recommended for future studies to attain a more diverse sample to increase the generalizability of the findings.

A second limitation is that only one unexpected-vegan product was used during the experiment. Furthermore, palm oil was displayed on the ingredient list (see Appendix) which

might affect the perceived environmental friendliness and perceived sustainability, since palm oil is oftentimes associated with deforestation and other environmental harm (Meijaard et al., 2020). Nevertheless, despite of this the chocolate chip cookies containing a vegan label were perceived as more environmentally friendly and more sustainable. However, it might be possible that this effect is more profound when palm oil is removed from the ingredient list.

Hence, it is recommended for future studies to include a variety of different unexpected-vegan products, while attending to the ingredients, to increase the internal validity of the study. By adding more unexpected-vegan products to the experiment, future studies can investigate whether the effects found by Stremmel et al. (2022), or by the present study, are replicable. For example, future studies could investigate whether similar effects occur when labeling other hedonic products as vegan, or if the chocolate chip cookies from the present study are an exception. Thereby, future studies could establish causality between a broad range of product types and the perceptions evoked by those products.

The third and final limitation of the present study is that the experiment was conducted by means of an online survey. To scrutinize the actual consumer behavior, and increase the ecological validity, future studies are recommended to use a more realistic experimental setup. For example, by letting consumers rate certain products in an actual shopping environment with multiple products on the shelves. Instead of focusing on a single product displayed on a screen, consumers will have a more genuine experience with the opportunity to compare products to each other. This was not possible during the experiment, but would have been possible in a real-life scenario. For instance, future research could investigate if an unexpected-vegan product evokes perceptual biases if it is located between similar, yet non-vegan, products, and if these biases differ in strength depending on the placement of the product. As described by Shaw et al. (2020), “more prominent placement strategies are associated with higher sales and consumption of both healthy and unhealthy foods” (p. 1043).

It would be interesting to investigate whether prominent placement in combination with the contrast effect of placing an unexpected-vegan product between non-vegan products affects the sales.

Lastly, another direction for future research would be to examine whether the present findings or the findings by Stremmel et al. (2022) can be replicated if the packaging indicates that a product is plant-based instead of vegan. Even though both concepts convey the same meaning, there are different associations evoked by the definitions of ‘vegan’ and ‘plant-based’ (ProVeg, 2022c). Moreover, these associations may differ per sample. For example, flexitarians from the United States have different associations with these definitions than flexitarians from the United Kingdom. Therefore, from a policy perspective, it might be interesting to examine if using different definitions for the same concept might lead to a difference in perceptual biases in different countries or cultures.

### **Theoretical and Practical Implications**

A theoretical implication that can be drawn from the present study is that adding a vegan label to an unexpected-vegan products is ethically ambiguous. On the one hand, a vegan label communicates transparency about the production process and the origins of a product (European Vegetarian Union, 2019). On the other hand, a vegan label biases the perceptions of the consumers. As the results from the present study indicated, chocolate chip cookies containing a vegan label were perceived as more environmentally friendly and more sustainable. However, a vegan label signifies that the product does not contain any animal-based ingredients, nor that any animal-related components were used during the production process (European Vegetarian Union, 2019; VSMK, 2016). Thus, it does not communicate anything about the actual environmental friendliness or sustainability. Therefore, it could be possible that a product is vegan, yet detrimental to the environment. For instance, a product

could contain non-sustainable palm oil, which causes environmental harm despite being vegan (Meijaard et al., 2020).

Consequently, concerning the practical implications, manufacturers and marketers for unexpected-vegan (hedonic) products should be reluctant when labeling their products as vegan. On the one hand, the results from the present study indicated that labeling an unexpected-vegan product as vegan does not lead to the perception that the product is less tasty, which is the most important characteristic for hedonic food (Loebnitz & Grunert, 2018). On the other hand, however, adding a vegan label to an unexpected-vegan product affects the perceived environmentally friendliness and perceived sustainability, but it does not affect the willingness to pay. Moreover, consumers nowadays are more mindful when grocery shopping, as they “are ever more aware that their choices have long-lasting environmentally, social, and economic implications” (Benos et al., 2022, p. 528). Therefore, adding a vegan could be beneficial from a transparency perspective (European Vegetarian Union, 2019), but it might also deceive consumers in believing that a product is more environmentally friendly or sustainable than it actually is.

Ultimately, this could lead to an increase in sales, considering that an increasing number of consumers attach great importance to sustainability (Beeson, 2022). Similarly, this was corroborated by Stemmel et al. (2022), as they warned that particularly consumers who place increased emphasis on food healthiness and sustainability might be misled by biased perceptions evoked by the vegan label if unexpected-vegan products are explicitly labeled as vegan. Thus, from a marketing or branding perspective, adding a vegan label might seem to be beneficial for a manufacturer, as this could positively affect the unexpected-vegan product’s image with regard to the perceived environmentally friendliness and sustainability. Thereby, manufacturers would likely target an expanding market segment of not only vegans and flexitarians, but also mindful or green consumers. However, without communicating

anything about the true sustainability, adding a vegan label cannot be fully recommended as this could be perceived as a form of greenwashing. According to the Cambridge Dictionary, the definition of greenwashing is “to make people believe that your company is doing more to protect the environment than it really is” (Cambridge University Press, n.d.). Since unexpected-vegan products are already vegan by default, companies do not have to make any meaningful changes to their ways. As a consequence, these companies could use vegan labels to make their products appear more environmentally friendly, even if they are not actually more sustainable than other products.

### **Conclusion**

The present study did not find a relation between labeling practice, monthly income and the willingness to pay. Taking into account the findings and limitations of this study, as well as the results from previous research, it seems worthwhile to further examine the effects of labeling unexpected-vegan products as there is still much to discover with regard to this specific product category in relation to perceptual biases and consumer behavior. While the vegan label can be a useful tool for consumers to identify products that are free from animal-derived ingredients, companies may misuse the vegan label to make their products appear more environmentally friendly or sustainable than they actually are.

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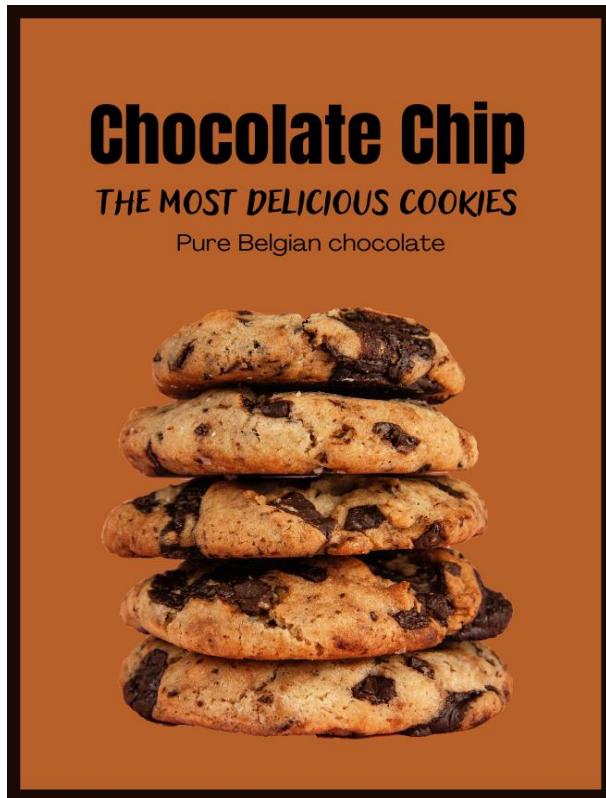
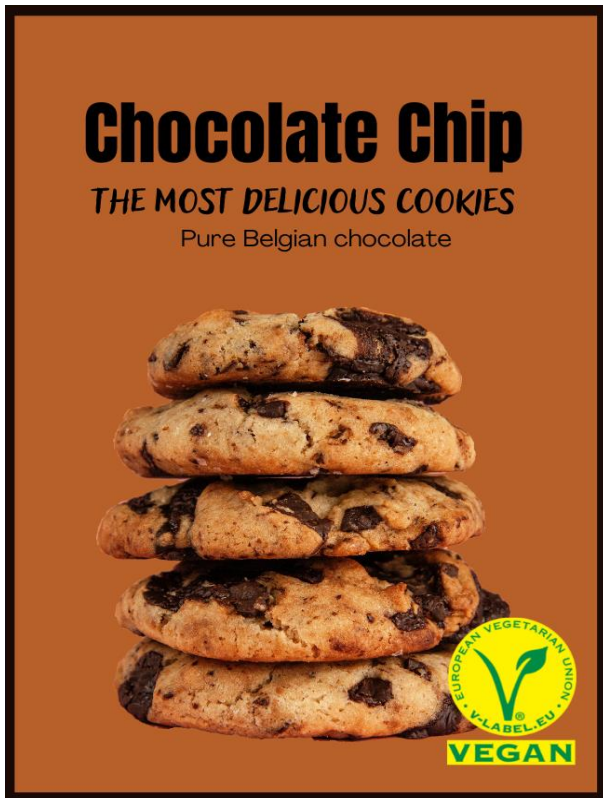
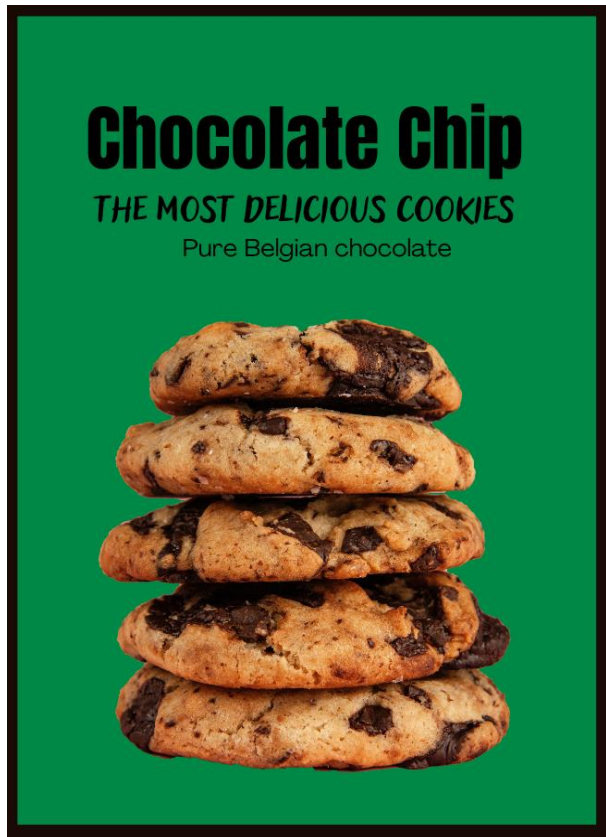
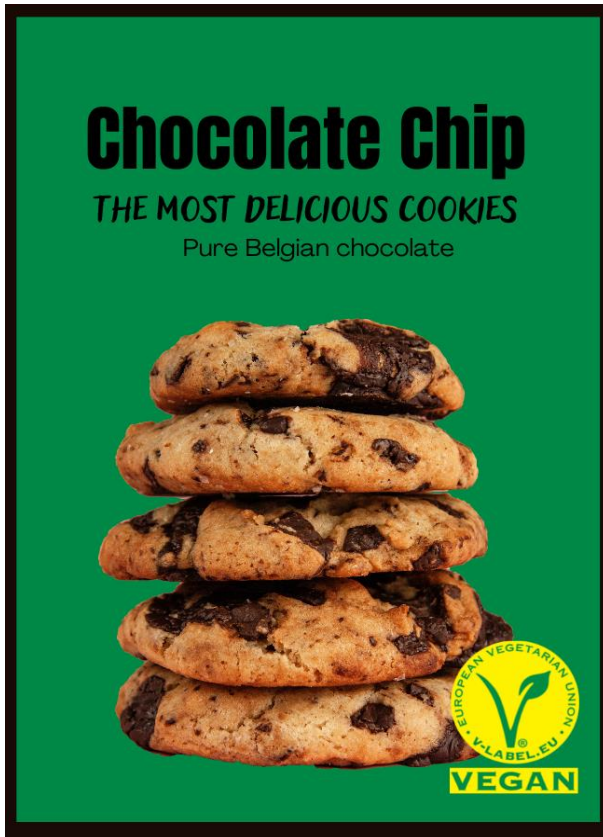
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Appendix

Images of the Four Different Packagings Used During the Experiment




# Chocolate Chip

*THE MOST DELICIOUS COOKIES*

Pure Belgian chocolate

Ingredients: Wheat flour 34%, chocolate 33.4% sugar, cocoa mass, vegetable fats (palm, shea in varying proportions), dextrose, cocoa butter, emulsifier [SOYALECITHINEN]), palm oil, sugar, raising agents (ammonium carbonates, sodium carbonates, diphosphates), salt, coloring agent (beta carotene), flavoring

May contain traces of egg, milk and nuts.



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