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ORIGINAL ARTICLE

Perception of vegan food: The case of a cookie

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Abstract

This study examined attitudes toward vegan diets and the impact of marketing on omnivores' perception of vegan food. An online survey among adults recruited through social networks assessed attitudes toward vegan diets, followed by experiment testing marketing strategies. Results indicate that while omnivores recognize the benefits of a vegan diet, they find it unsatisfying and impractical. In the experimental phase, participants rated a cookie labeled as vegan equally acceptable to a control cookie and were willing to pay more, though their purchase likelihood was lower. The marketing strategy highlighting motivation for vegan production had no effect on their ratings.

KEYWORDS

buying likelihood, cookie, marketing strategy, vegan food, willingness to pay

INTRODUCTION

One can look at food from many different perspectives. It is fuel, the center of many social events, and a part of human culture and history. The goal of marketing strategies is to increase sales, and therefore profit, but there are many examples of food marketing that aim to increase consumption of healthy foods by using appealing descriptors that raise taste expectations or increase value perception (Grabow et al., 2020; Wansink & Love, 2014). Healthy food marketing has a challenging task of fighting against "unhealthy = tasty" intuition (Raghunathan et al., 2006). By putting "healthy" on their packaging, companies might increase sales among health-conscious consumers while steering away others who expect healthy food to be less tasty. Healthy food has also been shown to be perceived as less filling (Suher et al., 2016) and lower in calories (Carels et al., 2007). Stating that a food product is vegan (a food item that is entirely free of animal-derived ingredients and byproducts) makes it easier for vegans (individuals who avoid consuming or using any products derived from animals) to identify it as

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suitable for them, but it also might make it less desirable to nonvegans. To understand why it is important to make vegan food more acceptable to the general population, it is useful to consider the environmental, health, and ethical benefits it provides. Unlike the low-fat or nongluten diets, a vegan diet has the potential to have a strong impact on human health and the wellbeing of animals and the planet. For example, greenhouse gas emissions from animal agriculture match those caused by fossil-burning vehicles (Jackson et al., 2020) and dietary meat reduction in the human diet has been recognized as an important factor in slowing down climate change (Gerber et al., 2013) and biodiversity conservation (Machovina et al., 2015). Environmental concerns have become even more important since climate change was declared a global emergency (Ripple et al., 2021). Even still, it can be challenging to connect the food we put on our plates to a global problem, and animal suffering involved in meat production is always disconnected from the end product, making it easy to ignore.

REVIEW OF LITERATURE

Fox and Ward (2008) found that vegans list environmental concerns, animal suffering, and personal health to explain their choice to live a vegan lifestyle, but it is very rare that someone's motivation for the initial switch is of environmental nature, and most make the change for health concerns. The most frequently mentioned motivation for omnivores (a person who consumes both plant-based and animal-based foods) to consider adopting a vegetarian diet (a dietary pattern that excludes meat, fish, and poultry but may include dairy, eggs, or both) is for health reasons as well (Mullee et al., 2017). One could argue that the positive impact of meat reduction on our health is the most visible and direct benefit to us, making it a salient motivator. Despite it being the most common motivator, health has less of a "staying power" than reducing animal suffering, as ethical vegans adhere to a vegan diet longer than health vegans (Radnitz et al., 2015). Despite all the benefits a vegan diet might offer, some people seem unwilling to make the change and even exhibit animosity toward people who have already decided to go plant-based. The reasons for this are complex and interconnected, and we will focus on three of the most often mentioned ones.

First, a shift to a vegan diet can be seen as a threat to customs, culture, and identity. This threat is particularly prominent among right-wing adherents (Dhont & Hodson, 2014) who are more resistant to such a change. Even when beneficial, change tends to be stressful, especially when it is related to something as pivotal for our existence as food. People might think that by forgoing meat and animal products, they are losing a part of their identity, from childhood comfort foods to traditional dishes ingrained in their heritage. A potential benefit people see in changing their diets is discovering new foods and flavors, cited as a factor omnivores consider when thinking about excluding meat from their diets (Mullee et al., 2017).

The second reason why people find it hard to accept veganism is that it challenges omnivores' morals. The fact that most people agree we should treat animals well and at the same time consume meat is called "the meat paradox" (Rothgerber, 2014). The stark difference between ethical beliefs of kindness and behavioral pattern of contribution to cruelty causes cognitive dissonance, defined by the theory of cognitive dissonance (Festinger, 1957). Usually, omnivores can ignore this dissonance because eating meat is the norm, but the presence of a vegetarian or a vegan makes the dissonance salient, serving as a reminder that eating meat is a choice. To deal with the discomfort caused by the cognitive dissonance, meat-eaters use many strategies, ranging from avoidance of information, dissociation, denial of animal pain, and believing they have no real choice in their diet to convincing themselves that they eat less meat than they actually do (Rothgerber, 2014). The other common approach to reducing discomfort is degrading the person causing it. Omnivores expect to be judged by vegans based on their ethical choices, causing them to engage in the "dogooder derogation," describing vegans

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in a negative manner as a result of their overtly moral behavior. This counterintuitive pattern of putting down persons because of their choices can be explained well by anticipated moral reproach theory (Minson & Monin, 2012). Vegans and vegetarians pose a symbolic threat to omnivores' selfimage as good and ethical people who expect that their morality will be seen as inferior in comparison to those of vegans. When asked, omnivores rate themselves as less moral than vegetarians (Minson & Monin, 2012) and expect their morality to be rated as low by vegetarians. In the same research, vegetarians did rate omnivores' morality lower than their own, but not as much as omnivores expected them to. This indicates that expectations of reproach are more important than the actual reproach exhibited by vegetarians. Expectation of moral reproach might in part be the reason why omnivores exhibit a negative attitude toward vegans.

The third reason one can find for resistance against changing diet is the food itself. Research suggests the biggest obstacles to following a vegan diet are taste, price, and practicality (Bryant, 2019). The same paper also reported that the vegan diet is perceived as less healthy, tasty, enjoyable, and acceptable than a vegetarian diet. Lack of interest and not liking healthy food affects not only a person's own health but also reflects on other household members (Birmingham et al., 2004). Mullee et al. (2017) report taste as one of the main reasons for not being vegetarian, alongside a lack of interest and awareness. Vegan food has a reputation for being bland, and attitudes and expectations may play a vital part in this perception. An experiment using cookies (Hennigan, 2015) showed a correlation between attitudes toward veganism and the taste preference of a product labeled "vegan," where more negative attitudes predicted lower taste ratings of the cookie. In the same experiment, participants showed a preference for a "classic" cookie in a condition where the moral threat was salient. Similarly, people expect low-fat food to be less tasty (Tuorila et al., 1994) and food labeled "organic" to be more nutritious (Lee et al., 2013). This is probably one of the main reasons the willingness to pay (WTP) for organic food is higher (Lee et al., 2013). This has important implications for marketing practices; one can change expectations, and even taste perceptions, of a food product by putting a different label on it. Research on attitudes toward a vegan diet and perception and expectations regarding vegan food could guide marketing efforts to be more efficient and fruitful.

Building on this literature review, the study presented in this paper aimed to investigate both attitudes toward a vegan diet and the influence of different labeling on consumer perceptions, broadening our understanding of how to effectively market vegan products to a diverse audience.

Research goal and hypotheses

This study had two main goals. First, it aimed to explore attitudes toward the vegan diet in relation to the respondent's current diet. The second goal was to experimentally determine the impact of different vegan food labeling on omnivores' perception of acceptability, expected price, WTP, and intent to buy that product. A cookie was chosen for this study because it is a universally liked product, enjoyed by people of all ages and dietary preferences. Its familiarity ensures that consumers have well-defined expectations regarding taste and price, allowing for clearer insights into how marketing strategies can alter these perceptions.

We hypothesized that omnivores would have a negative attitude toward a vegan diet, scoring below the central value on the attitudes toward vegan diet scale, while the attitudes of vegetarians and vegans will be more positive.

In the experimental part of the study, we hypothesized that omnivores would rate the cookie labeled "vegan" as less acceptable, rate their WTP for it and expected selling price as higher, and exhibit less intention to buy the product compared to the control cookie.

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Furthermore, compared to a cookie labeled only as "vegan," we hypothesized that participants would rate the same product when also marketed as "healthier" as more acceptable because of its vegan ingredients, with a higher WTP and a higher expected selling price, and with a greater intention to buy the product. On the other hand, when presented with a message emphasizing the reduction of animal suffering in the food industry, we hypothesized that the same cookie would be rated as less acceptable, with participants reporting a lower WTP and a lower intention to buy, but a higher expected selling price compared to the cookie labeled only as "vegan." Based on anticipated moral reproach, a cookie with marketing directed toward reducing animal suffering would be a stronger threat than the same cookie marketed as healthier, or just "vegan." That would in turn activate defensive mechanisms which would lead omnivores to disparage the product (Minson & Monin, 2012).

METHODOLOGY

Participants

Overall, 1305 participants aged 18 or older started filling out the survey. Participants who did not complete the attitude toward the vegan diet scale were excluded from all the analyses, so the sample consisted of $N = 1166$ participants. More respondents identified as female ($N = 866$; 74.3%) compared to male, while 15 participants selected "Other" or "I don't want to answer." The age range of participants was from 18 to 70 years ($C = 24$; $M = 26.17$; SD = 8.16). In terms of education, the largest proportion of participants had a high school diploma (40%), followed by bachelor's degree (31%) and master's degree (25%), with less than 1% of participants having a highest achieved education level of primary school or a postgraduate degree. Considering the type of diet, the sample consisted of $N = 971$ (83%) omnivores (eat every food group), $N = 101$ (9%) vegetarians (do not eat meat [including fish] but consume eggs and milk), and $N = 94$ (8%) vegans (avoid all animal products). The proportions of vegetarians and vegans are higher than in the general population due to data collection efforts of targeting groups interested in a plant-based lifestyle.

Study design and procedure

IRB approval from the Department of Psychology at the University of Zagreb was obtained before data collection began. Data were collected via an online platform. An invitation to partake was distributed through social networks, with an emphasis on groups centered around food and recipes, vegetarian groups, and vegan nonprofit organizations. Participants were not offered any compensation. The first part of the questionnaire included socio-demographic questions, followed by attitudes toward vegan diets measured by a scale (Faber et al., 2020). The next part of the study was experimental. Participants were randomly divided into four groups. All participants were asked to answer the same questions regarding the evaluation of a cookie.

The cookie was presented as a new cookie on the market, and all respondents saw the same image as well as the same list of main ingredients (flour, sugar, and chocolate chips). However, they were given different descriptions of this cookie (Table 1). Group one (control) had no additional information. For group two (vegan description), the cookie was described as a new vegan cookie on the market. Group three (vegan + health description) had, along with the vegan description, a marketing message that described the product as healthier because of its vegan ingredients. The fourth group (vegan + animals description) was presented with the

TABLE 1 Description of a cookie given to different experimental groups.

Group	Description
Control	In front of you is a picture of a new cookie on the market. The main ingredients of this cookie are flour, sugar, and chocolate chips. All questions below apply to this new cookie
Vegan	In front of you is a picture of a new **vegan** cookie on the market. The main ingredients of this cookie are flour, sugar, and chocolate chips. All questions below apply to this new cookie
Vegan + Health	In front of you is a picture of a new **vegan** cookie on the market. The main ingredients of this cookie are flour, sugar, and chocolate chips **and it does not contain any animal products to make it healthier than conventional cookies**. All questions below apply to this new vegan cookie
Vegan + Animals	In front of you is a picture of a new **vegan** cookie on the market. The main ingredients of this cookie are flour, sugar, and chocolate chips **and it does not contain any animal products to reduce animal suffering in the industrial food production**. All questions below apply to this new vegan cookie

same description as the third group, apart from a message that emphasized reducing animal suffering in the food industry instead of a message about health benefits. All groups were shown a photograph of two chocolate chip cookies on a white background without packaging.

After reading the description, participants answered questions about the cookie (acceptability, WTP, expected price and likelihood to buy). The average time taken to complete the questionnaire was five minutes.

Instruments

Attitudes toward vegan diets in the first part of the study were measured by the Attitudes Toward PlantBased Diet Scale used in Faber et al. (2020), adapted to be used for a vegan diet. The scale starts with the sentence "A vegan diet…", followed by nine items indicating attitude, for example "is healthy" or "takes into account animal welfare." Participants indicated their level of agreement with these sentences on a 5-point Likert scale ranging from "completely disagree" to "completely agree." The authors of the scale report a unidimensional structure with high reliability. Principal component analysis in this research also yielded a onefactor solution with 54.24% variance explained (Table A1 in Appendix), but confirmatory factor analysis did not result in a satisfactory fit (see Table A2 in Appendix). The fit of the onefactor model was compared to a threefactor model and a bifactor model, which includes three group factors and one general factor. Models were constructed based on itemcontent analysis, with three items loaded on each group factor. The bifactor model was accepted, with a general factor measuring general attitude and three group factors named *Benefits*, *Satisfaction*, and *Practicality*, as shown in Figure A1 in Appendix. Cronbach alpha reliability for this scale is $\alpha = 0.88$. Reliability of subscales Practicality is $\alpha = 0.71$, Satisfaction $\alpha = 0.89$, and Benefits $\alpha = 0.80$.

The acceptability of cookies in the experimental part of the study was measured by the 9-point hedonic scale (Peryam & Pilgrim, 1957) applied to seven sensory characteristics. Participants evaluated the acceptability of appearance, texture, color, sweetness, moistness, flavor, and overall acceptability of cookies. Those characteristics were used in prior research (Ibrahim, 2013), and participants were asked to make their evaluations according to how they imagine the cookie would be. They indicated their answers on the 9-point hedonic scale which consists of nine categories ranging from "extremely dislike" to "extremely like." The score was calculated by averaging

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the answers for each participant. The scale exhibited acceptable reliability ($\alpha = 0.80$). To measure WTP, respondents were presented with an image of a packet of Oreo cookies along with their store price (14.99 in local currency). That price served as a reference point for an open-ended question "How much would you be willing to pay for a same sized package of this new cookie?" A similar setpoint method was used in prior research regarding calorie estimates (Chernev & Gal, 2010). Two additional questions regarding the price and desirability of the product were added. The first one was an open-ended question where respondents estimated what they expected a package of cookies would cost in stores. The second was a Likerttype question which asked respondents their likelihood of buying the new cookie in the next six months. Answer options to this question ranged from "Definitely not" (1) to "Definitely yes" (5).

Data analysis

Following results from confirmatory factor analysis, the answers provided by omnivores, vegetarians, and vegans on the questionnaire were compared on each subscale of the attitudes toward vegan diet scale (Benefits, Satisfaction, and Practicality) and on the overall attitude toward vegan diet. The result on each subscale was calculated as a mean of the items in the subscale, so the results range from 1 to 5, with a higher result denoting a more positive attitude. First, the normality of the data was tested by checking skewness and kurtosis and visual inspection of histograms. While the distributions did not deviate drastically from a normal distribution, variances between groups were significantly different (tested by Levene's test), leading to nonparametric data analyses. For this reason, the Kruskal–Wallis test was used to test the differences between omnivores, vegetarians, and vegans on their attitudes on benefits, satisfaction, and practicality of a vegan diet. Dunn's multiple comparison test was used for post-hoc testing.

In the analysis of the experimental part of the study, only omnivores who gave responses to all items relevant to the experiment were included. The main reason for including only omnivores is that vegans and vegetarians in the sample might be biased toward the marketing of vegan food, potentially skewing the data with more positive ratings. Furthermore, our primary interest was to test the effectiveness of a marketing strategy aimed at attracting new consumers, not those who are vegan or vegetarian who may already be more inclined to buy vegan products.

To test for the effects of including the word "vegan" in the description of the cookies, *t*tests were used to compare the control condition group (who saw the description of the cookie without the word "vegan") and the vegan experimental condition group (who saw the description with the word "vegan") as the assumptions for parametric testing were met. Items measuring the expected price of the product and WTP were openended, so outliers were identified using the interquartile range criterion, where results that fall more than 1.5 times the interquartile range below the first quartile or above the third quartile were removed, following the recommendation of Oyeyemi et al. (2015). This procedure led to the exclusion of five respondents in the expected price variable and ten in the WTP variable.

The vegan experimental condition group in prior analyses served as a control in testing the influence of including motivation for veganism in the marketing of a vegan product. It was tested against the vegan+health experimental condition (the description of the cookie included the health benefits as the motivation for producing a vegan product) and the vegan+animals experimental condition (the description of the cookie included the benefits for animals as the motivation for producing a vegan product; see Table 1) using one-way ANOVA. The same dependent variables were used, as well as the same criterion for excluding participants based on their results. There were 53 respondents removed based on their response on expected price and 23 based on their WTP result.

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RESULTS

Attitudes toward vegan diet

The Kruskal–Wallis test revealed significant differences between omnivore, vegetarian, and vegan participants on all tested subscales and the overall scale with large effect sizes, as shown in Table 2. Results of the post-hoc testing indicate that the omnivore participants had significantly more negative attitudes compared to vegetarian and vegan participants on all the subscales. Vegetarian and vegan participants did not differ in their attitudes toward the benefits and satisfaction of a vegan diet, as well as their overall attitudes, but they did differ in their views on practicality, where vegan participants exhibited more positive attitudes. Regarding the overall attitudes, the omnivore participants exhibited negative attitudes, scoring slightly below the midpoint of the scale, while vegetarian and vegan participants scored above the midpoint of the scale, confirming our hypothesis.

Effects of vegan marketing

As mentioned earlier, the experimental part of the study tested the effects of including the word "vegan" in the description of a new cookie on the market, focusing exclusively on the responses from omnivores. We first compared the control group (who saw description of the cookie without the word "vegan") to the experimental group labeled vegan (who saw description of the cookie indicating that the cookie was vegan). As shown in Table 3, the control group and vegan group differed on all variables, except acceptability.

WTP and expected price were higher in the vegan condition, while participants in the control group were more likely to buy the cookies with medium, large, and small effect sizes, respectively. Results partially confirm the second hypothesis.

Effects of different vegan motivation advertising

To test the effectiveness of including different motivations for veganism, in the next step we compared the ratings of acceptability, WTP, expected price, and likelihood to buy among three

TABLE 2 Comparison of attitudes toward vegan diet between omnivore ($N = 971$), vegetarian ($N = 101$), and vegan ($N = 94$) participants using Kruskal–Wallis tests.

Subcale	Diet type	*M*	SD	*H* (12)	η_p^2
Benefits	Omnivore	3.55	0.75	319.36**	0.27
	Vegetarian	4.41	0.59		
	Vegan	4.52	0.60		
Satisfaction	Omnivore	2.99	0.88	573.08**	0.49
	Vegetarian	4.40	0.65		
	Vegan	4.69	0.60		
Practicality	Omnivore	2.23	0.64	385.8**	0.32
	Vegetarian	3.02	0.76		
	Vegan	3.49	0.77		
Attitudes overall	Omnivore	2.92	0.60	623.81**	0.52
	Vegetarian	3.94	0.53		
	Vegan	4.23	0.58		

*$p < 0.05$. **$p < 0.01$.

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TABLE 3 Comparison between the group presented with the cookie without the word "vegan" (control; $N = 209$) and the group presented with the cookie described as vegan (vegan; $N = 191$) in the experiment using *t*-tests.

Variable	Group	*M*	SD	*t*(398)	Cohen's *d*
Acceptability[a]	Control	6.76	1.15	0.16	0.02
	Vegan	6.75	1.19		
Willingness to pay (WTP) (in local currency)	Control	11.90	3.30	−6.26**	−0.63
	Vegan	14.10	3.72		
Expected price (in local currency)	Control	16.07	4.68	−11.14**	−1.11
	Vegan	21.90	5.74		
Likely to buy[b]	Control	2.67	1.02	2.91*	0.29
	Vegan	2.38	0.93		

[a]Average for 7 characteristics on a scale from "extremely dislike" (1) to "extremely like" (9).
[b]On a scale from "definitely not" (1) to "definitely yes" (5).
*$p < 0.05$. **$p < 0.01$.

TABLE 4 Results of one-way ANOVA between experimental groups with different vegan motivation advertising.

Variable	Group	*N*	*M*	SD	*F*(523)	*p*
Acceptability[a]	Vegan	178	6.78	1.18	1.20	0.27
	Vegan + Health	167	6.40	1.26		
	Vegan + Animals	180	6.64	1.23		
Willingness to pay (WTP) (in local currency)	Vegan	178	14.23	3.50	0.02	0.88
	Vegan + Health	167	14.57	3.54		
	Vegan + Animals	180	14.18	3.70		
Expected price (in local currency)	Vegan	178	22.17	4.78	0.09	0.77
	Vegan + Health	167	22.96	4.59		
	Vegan + Animals	180	22.32	4.61		
Likely to buy[b]	Vegan	178	2.41	0.92	0.68	0.41
	Vegan + Health	167	2.32	0.89		
	Vegan + Animals	180	2.49	0.91		

[a]Average for 7 characteristics on a scale from "extremely dislike" (1) to "extremely like" (9).
[b]On a scale from "definitely not" (1) to "definitely yes" (5).

experimental groups: vegan description (who saw a description of a cookie that simply stated it was vegan), vegan+health description (who saw a description emphasizing health benefits as the reason for producing the vegan cookie), and vegan+animals description (who saw a description highlighting reduced animal suffering as the motivation for producing the vegan cookie).

None of the results were statistically significant, leading to the conclusion that including motivation to produce a vegan product did not influence the ratings of acceptability, WTP, expected price, nor the likelihood to buy the product, rejecting the third hypothesis. Results of these analyses are shown in Table 4.

DISCUSSION

In line with our expectations, omnivore participants, on average, exhibited slightly negative attitudes toward a vegan diet, scoring right on or below the midpoint of the rating scale, except

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for the subscale measuring perceived benefits where the average result of the omnivore participants was higher than 3. It seems that they recognized the benefits of veganism for human health, animals, and the planet, but vegetarian and vegan participants exhibited more positive attitudes compared to omnivore participants. The aspect of the vegan diet that was the most negatively evaluated was practicality. It is also the only aspect where vegetarian and vegan participants differed, with vegans holding a more positive attitude compared to vegetarians. Omnivore participants had a more negative attitude than the other two groups. This pattern remained true for the satisfaction one can get from a vegan diet, where omnivore participants perceived it as less satiating and enjoyable.

One explanation for these results could potentially be cognitive dissonance. Omnivores might believe there are benefits to a vegan diet and consequently that their current diet is harmful to the animals, the environment, and potentially themselves (Povey et al., 2001). Despite that, their behavior is not aligned with that belief, so to justify the choices they might engage in dissonance-reducing strategies (Rothgerber, 2014). By describing the vegan diet as unenjoyable and impractical, they can explain why they do not follow a plantbased diet as well. Along those lines, vegetarian participants agree with vegan participants in terms of benefits and satisfaction regarding a vegan diet. Still, vegetarian participants consider it less practical. Here, cognitive dissonance might also be in play, explaining why they did not exclude all animal products if they think veganism is both beneficial and enjoyable. However, it must not be ignored that certain vegan products are more expensive and potentially less available in certain areas. Someone following a vegetarian diet in an area with a limited choice of vegan products might find it too complicated to be completely plant-based, despite wanting to be vegan. Interestingly, some prior research suggests that vegetarians are more similar to omnivores compared to vegans in regard to their attitudes toward the vegan diet (Fediw, 2018), but in this sample, they seem to align more with vegans.

Although omnivore participants described the vegan diet as less enjoyable compared to vegetarian and vegan participants, their ratings of acceptability of the cookie in the experiment were not lower when the cookie was labeled as vegan compared to a cookie without such a label. This unexpected result may have been influenced by the choice of the food item in this study. Cookies are generally a very palatable dessert, achieving high acceptability ratings across different research settings (Ibrahim, 2013; Provencher et al., 2009). If that is combined with information about the composition of the cookies at hand (flour, sugar, and chocolate), consistent high positive ratings of acceptability are not surprising. It might just be that a cookie, no matter what, is still a cookie.

Considering other variables in the experiment, comparing the control group (omnivores who saw basic description of the cookie without mentioning it was vegan) to the experimental group labeled vegan (omnivores who saw the description of the cookie mentioning it was vegan), all the differences were statistically significant. First, participants stated they would be willing to pay (WTP) more for a vegan cookie compared to a classic one. As vegan food is often considered healthier, in an experiment comparing "classic" and "healthy" cookies, healthy cookies were considered more expensive (Provencher et al., 2009). Although not the same, it can be compared to research on organic products which find people are willing to pay more for organic compared to conventionally grown food (Lee et al., 2013). Organic food has also been found to be perceived as healthier but less tasty (Schuldt & Hannahan, 2013), something that seems to be in line with the perception of vegan food. The expected price was also higher in the experimental group labeled vegan.

The most telling variable for the influence of including the word "vegan" in the marketing is the likelihood to buy the product. Participants stated they were less likely to buy the cookies in the next six months in the vegan description condition. Previous research is in line with ours. In an experiment where vegetarian dishes were either listed on a general menu or on a separate list labeled "vegetarian," the same dishes, when labeled, were less likely to be chosen

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(Bacon & Krpan, 2018). The same effect was found in a study by Berke and Larson (2023) where "vegan" or "vegetarian" labels in the menu titles significantly reduced the probability of an item being chosen. As the word "vegan" seems to have a negative connotation, labeling a product "plantbased" might be more appropriate if the goal is to appeal to a wider audience (Faber et al., 2020).

Contrary to our expectations, we found no difference between vegan + animals description condition and other groups on ratings of the cookie. The first explanation might be that participants lowered their likelihood to buy just because the product is vegan and were not prone to give even lower ratings. The second thing to consider involves description of the cookies, and cookies as a product in general. Unlike a hamburger, for example, which involves meat and, unquestionably, an animal must die to make it, in the milk and eggs conventionally used in cookie production, the suffering is not so overt. It might be that milk and eggs are not seen as morally doubtful products by omnivores in general, which would in turn make products that do not contain these ingredients no different from products containing these ingredients. This can also be the reason why the vegan + health description group did not differ from other groups. Cookies are thought of as unhealthy food, so marketing them as healthy because of their vegan content might not be believable to customers.

LIMITATIONS

It is important to mention the limitations of this study. Going back to the sociodemographic data, women are overrepresented in the sample and this not only makes the generalization of results limited, but it is possible that it also influenced the results. It is documented that men on average have a more negative attitude toward vegetarian diets compared to women (Bacon & Krpan, 2018; Berke & Larson, 2023; Chin et al., 2002). This might mean that attitudes toward a vegan diet measured in this study are more positive than they are in the general population. Focusing on the experimental design, choosing a more neutral food product might be a better choice. Another improvement could be made in the description, where avoiding mentioning ingredients like sugar and chocolate can make the manipulation more effective.

Implications and future research

Despite these limitations, several recommendations can be made based on the results of this study. Vegan food marketing should focus on educating consumers. Consumers who do not think about product composition or read labels are likely unaware of which products are vegan unless it is explicitly stated. For example, a very popular cookie that was shown in our experiment as a reference point against which participants were asked to estimate the expected price of a new cookie is, in fact, vegan by composition, although this information is not explicitly highlighted on its packaging. Similarly, many products that people regularly consume are vegan, and drawing attention to the fact that vegan food is already present in the diet of most omnivores could potentially reduce biases against vegan food as being tasteless and unsatisfying.

Furthermore, since omnivores perceive vegan food as impractical, efforts should be made to promote practical, convenient vegan options for everyday diets. However, in marketing vegan products, it might be more efficient to avoid the word "vegan" and use other labels, such as "plant-based." The fact that the vegan cookie in this study was rated as equally acceptable as the cookie without the vegan label is an encouraging finding, but the results also highlight the need to debunk the myth that vegan options are more expensive and the need to make affordable vegan options more visible to consumers.

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Finally, emphasizing the motivation behind the production of the vegan product did not prove to be an effective strategy in this experiment, but it also did not cause any harm. Considering that the product choice in this study (cookies) does not allow for generalization to other food categories, future research should more closely examine the potential effects of highlighting health or environmental reasons for the production and consumption of plant-based products.

AUTHOR CONTRIBUTIONS

Gabrijela Mikulić planned the study, conducted the data analysis, and wrote the article as part of her master thesis research. Mirjana Tonković supervised the planning of the study and data analysis and contributed to revising the article for publication.

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CONFLICT OF INTEREST STATEMENT

Declarations of interest: none.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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APPENDIX

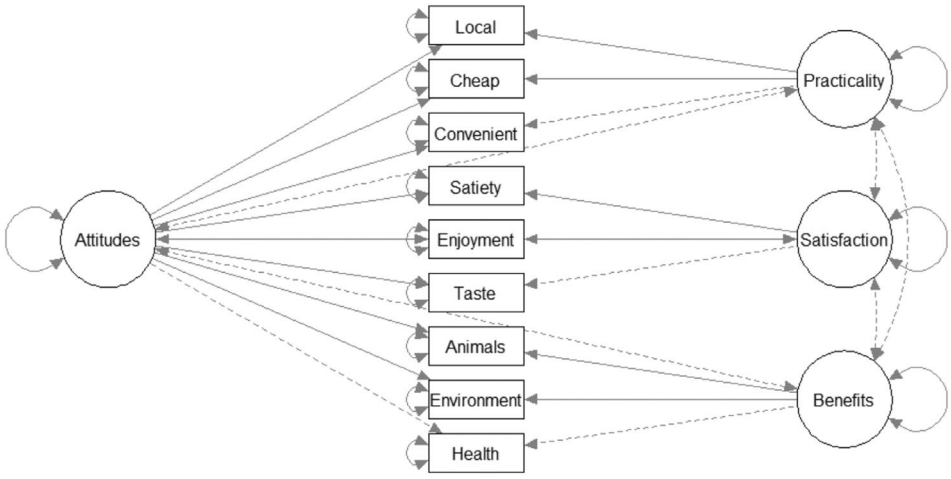


FIGURE A1 Bifactor model of attitudes toward vegan diet scale.

Confirmatory factor analysis was conducted on data from 561 respondents in order to separate it from the data used for exploratory factor analysis ($N = 605$). Data was separated into the two groups by chance. Three models were tested. One factor model suggested by the authors of the original scale, which was adapted to be used for this research, did not exhibit sufficient fit, indicated by TLI and CFI, and RMSEA and SRMR above the acceptable values as well. A three-factor model was tested next, where three items were loaded on each factor. Item distribution is the same as in the bifactor model, shown in Figure A1, but the bifactor model has a general factor Attitudes added. Table A2 shows the bifactor model has a better fit. The bifactor solution also means the results of the entire scale can be calculated and therefore compared to prior work. Factor loadings can be seen in Table A3. It is worth mentioning that the item describing the vegan diet as "local" does not seem to work as well as the other ones. In the exploratory factor analysis, it had the smallest factor loading (see Table A1). It is also questionable if it reflects the vegan diet on a conceptual level, so it might be worth replacing it with a better-fitting item for the Practicality subscale.

TABLE A1 Factor loadings from principal component analysis of Attitudes toward vegan diet scale.

Item	Factor loading	Uniqueness
Health	0.767	0.411
Environment	0.733	0.463
Animal welfare	0.678	0.541
Taste	0.827	0.316
Enjoyment	0.854	0.271
Satiety	0.810	0.344
Cheap	0.677	0.542
Convenient	0.722	0.479
Locally produced	0.499	0.751

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TABLE A2 Model fit statistics on Attitudes toward vegan diet scale.

Model	χ^2 (12)	Df	CFI	TLI	RMSEA	SRMR	$\Delta\chi^2$ (Δdf)
One factor	477.42	27	0.81	0.75	0.17	0.09	
Three factor	136.03	24	0.95	0.93	0.09	0.06	88.79 (3)**
Bifactor	47.24	18	0.99	0.98	0.05	0.03	341.38 (6)**

**$p < 0.01$.

TABLE A3 Factor loadings for bifactor model of attitudes toward vegan diet scale.

Item	Benefits	Satisfaction	Practicality	Overall attitude
Health	0.255			0.679
Environment	0.793			0.531
Animal welfare	0.465			0.478
Taste		0.479		0.709
Enjoyment		0.546		0.752
Satiety		0.296		0.715
Cheap			0.219	0.685
Convenient			0.932	0.592
Locally produced			0.069	0.481

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