Indulgence Sells: Marketing Vegan Pizza with Taste-Focused Framing

"Guardians of Gaia"

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PSYCH 421: Environmental Psychology

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April 8th, 2025

Executive Summary

The word “vegan” evokes a variety of stereotypes and responses, which can be met with either favourable opinions or aversion. To test taste-focused framing effects of vegan products on consumers, we added more visual and taste-focused descriptors to the Vegan Feature pizza dish at Mercante, an Italian pizzeria at the University of British Columbia Vancouver campus. This prompted our research question: “How does a poster with visually appealing and indulgence-focused descriptors influence consumer choice of vegan pizza?” We hypothesized that the presence of a poster (Experimental condition: March 13th to April 4th, 2025) emphasizing taste and visual attributes of vegan pizza would increase the sales of the vegan feature at Mercante, compared to no poster (Baseline condition: January 1st to March 12th, 2025) present. To conduct this study, we compared the sales data (proportion of vegan pizzas sold compared to the total pizzas sold) for the Vegan Feature before and after the poster intervention by using a between-subjects experimental design. Our results were significant (p-value = 0.01966) but with a small effect size (Cramer’s V ≈ 0.032). This suggests that the poster only increased the proportion of the Vegan Feature pizzas sold by a small margin.

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In the contemporary attempt to understand human drivers of climate change, the interplay between dietary patterns and land-use-based environmental harms has gained traction in the literature (Joyce et al. 2014; Burke et al. 2025). Agricultural land use for food production is attributed with approximately 30% of all global anthropogenic greenhouse gas (GHG) emissions, and is a driver of resource depletion (e.g. water, soil quality, deforestation) through the harvest, production, and distribution processes in the agri-food industry (Aleksandrowicz et al. 2014; Burke et al. 2025).

Several studies have suggested that a significant reduction in environmental harms can be achieved through a large-scale shift to plant-based diets (Burke et al., 2025). An environmental impact assessment for various food groups conducted by Burke et al. found that the largest contributor to GHG emissions was red meat (48.9%), followed by non-red meat (10.6%), seafood (7.4%), and dairy (7.4%) across all dietary patterns (2025). In corroboration with these results, a systematic review of plant-based diets conducted by Aleksandrowicz et al. (2016) concluded that shifts toward reducing meat in Western dietary patterns can lead to reductions as high as 70%-80% of land use and GHG emissions and 50% of water use (2014). Additionally, studies have found that diets containing less meat notably reduce GHG emissions during the primary production phase (growth and/or harvesting) of food products (Joyce et al., 2014).

Despite such environmental benefits of plant-based diets, consumers hesitate to adopt this diet due to prevailing perceptions of veganism and personal purchasing preferences (Branković et al., 2025). Branković et al. (2025) note that such perceptions often arise due to gender-based differences (veganism being considered as more of a feminine diet and consumed more by women than men) and differing generational attitudes (veganism being more common amongst Gen Z individuals living in America than those aged 60 or older). Since these perceptions are related to individual habits and mindsets, Branković et al. (2025)'s study comparing cheese labelled as "vegan" in contrast to "plant-based" highlights the potential for terminology to affect appeal as a targeted approach to foster consumer acceptance and interest. Although a separate study conducted by Turnwald et al. (2019) found that use of indulgent and appealing language to describe vegetables did increase consumer interest in vegan options compared to health-focused or neutral descriptions, there is limited research on how taste-focused framing could affect indulgent foods like a vegan pizza.

These knowledge gaps in existing literature inspired our research question, "How does a poster with visually appealing and indulgence-focused descriptors influence consumer choice of vegan pizza?" Hence, we hypothesize that the presence of a poster emphasizing taste and visual attributes of vegan pizza will increase the sales of the vegan feature at Mercante as compared to no poster present.

Methods

Total Sales: A priori power analysis determined we needed a minimum of 785 pizza sales to detect a small effect size (Cramer's $V \approx 0.10$), given $\alpha = .05$ and power = .80. However, our final sample far exceeded this threshold, with a total of 9,397 pizza sales, providing high sensitivity for detecting minor effects. During the baseline period (January 1

to March 12), 6,713 pizzas were sold, including 136 vegan pizzas (2%). During the experimental period (March 13 to April 4), 2,684 pizzas were sold, including 83 vegan pizzas (3%). Because each pizza sale served as a unit of analysis reflecting consumer behavior, rather than a response from an identified individual, no demographic data (e.g., age, gender) were collected. See sales data in Appendix B for a detailed breakdown of sales by condition and pizza type.

Conditions: Our independent variable was the presence of an indulgence-framed promotional poster advertising the Vegan Feature pizza. We operationalised this variable using a 2 (Framing Condition: Baseline vs. Experimental) × 2 (Pizza Type: Vegan vs. Non-Vegan) between-subjects design, resulting in four conditions: Baseline Vegan, Baseline Non-Vegan, Experimental Vegan, and Experimental Non-Vegan. In the baseline condition, no vegan promotional materials were imposed. In the experimental condition, a poster was placed near the ordering counter promoting the vegan pizza as "Pepperoni Giardino." The poster used indulgent, sensory-focused language and imagery to increase the pizza's appeal, including descriptors such as: "Featuring plant-based pepperoni," "Bold flavours, irresistibly tasty," and a visual of the pizza topped with arugula, mushrooms, tomato sauce, and plant-based meat. This framing was intended to shift perceptions of vegan pizza from health-oriented to desirable, flavourful, and indulgent, thereby increasing the likelihood that customers may choose the vegan option over non-vegan alternatives. See Appendix A for the full poster used in the experimental condition.

Measures: The dependent variable was the proportion of vegan pizzas sold relative to total pizza sales, directly reflecting consumer purchasing behavior. This was operationalized by analyzing Mercante sales data, counting vegan and non-vegan pizza purchases during baseline and experimental periods. Our approach aligned with established methods in consumer behavior research that prioritize observational data when testing product selection interventions. By focusing on purchase behavior rather than attitudes, we directly tested our hypothesis about framing effects on food choice.

Procedure: The study was conducted in two distinct phases: a baseline condition and an experimental condition. During the baseline condition, which ran from January 1st to March 12th, no promotional materials were used to advertise the Vegan Feature pizza. This allowed us to collect sales data reflecting consumer behavior in the absence of targeted marketing. In the experimental condition, which began on March 13th and continued until April 4th, we introduced an indulgence-framed promotional poster advertising the Vegan Feature pizza. The poster was strategically placed in high-traffic areas of the pizzeria, such as near the entrance and at the register, to maximize visibility and influence customer decisions. See Appendix C for intervention visuals.

Data collection spanned both conditions, allowing us to compare sales patterns before and after the intervention. However, several challenges arose that may have impacted our study procedure. First, there were delays in setting up the promotional poster due to logistical issues at Mercante, including their temporary lack of certain ingredients required for the vegan pizza. Additionally, communication with Mercante regarding timely access to sales data was a recurring issue throughout the term, requiring follow-ups to ensure we received complete and accurate records. Despite these challenges, we successfully gathered all necessary data to test our hypothesis.

Results

Descriptive Statistics: Sales data were observed in two different time intervals: a baseline interval (Jan 1 – Mar 12) and an experimental interval (Mar 13 – Apr 4). In the baseline interval, 6,713 pizzas were sold. Of these, 136 pizzas (2%) were vegan feature pizzas, and 6,577 pizzas (98%) were other types of pizza. During the experimental stage, a total of 2,684 pizzas were sold. Out of these, 83 pizzas (3%) were vegan feature pizzas, and 2,601 (97%) were other types of pizzas. Together, a total of 9,397 pizzas were sold during both time intervals. The proportion of vegan feature pizzas sold rose from 2% during the baseline period to 3% during the experimental period, showing a 1% increase in relative sales during the duration of the intervention. The contingency table can be found in Appendix B.

Statistical Analysis: A chi-square test of independence was used to assess if the proportion of vegan feature pizzas sold varied significantly during baseline versus experimental periods. The test was suitable since both the variables—time period (baseline vs. experimental) and pizza type (vegan vs. other)—were categorical and independent.

Assumptions of the Chi-Square Test: Before performing the chi-square test of independence, all of the necessary assumptions were checked and met to provide a valid analysis:

1. Independence of Observations: Each observation was independent and only accounted for a single category in the contingency table. Each pizza sale appeared just once in a mutually exclusive category (either other pizzas or vegan feature pizza).
2. Sufficient Sample Size: All the expected frequencies for the 2x2 contingency table were above the minimum of five.
3. Categorical Variables: Both variables are categorical. The independent variable of time period was nominal with two categories: baseline (Jan 1 – Mar 12) and experimental (Mar 13 – Apr 4). The dependent variable of pizza type was nominal with two categories: vegan feature pizza and other types of pizzas.
4. Random Sampling: While the data was based on naturally occurring customer transactions as opposed to a randomized sample, the sales information was obtained systematically across time and reflected normal customer patterns.

Result: $\chi^2(1, N = 9,397) = 9.58$, $p = .002$, Cramér's $V \approx 0.032$

The increase in vegan feature pizza sales from 2% to 3% during the experimental period was statistically significant at $p < .05$. The results support our hypothesis that the intervention increases vegan feature pizza sales. However, the magnitude of the effect was minimal, as indicated by the small Cramér's V value (≈ 0.032). This means that while the results support our hypothesis, the practical impact of the intervention was quite small.

Discussion

This study provides insightful data for framing effects on more indulgent foods such as pizza, addressing a notable knowledge gap in existing research that only examines ingredients such as vegan cheese or vegetables. The vegan pizza promotional poster

contributing to a proportional increase in sales (compared to the baseline period) indicates that incorporating indulgent framing and visual appeal to plant-based foods may attract customers and boost sales. This finding is consistent with research that suggests taste-focused framing can improve the purchase of vegan food, compared to health-focused framing (Turnwald et al. 2019). An implication of this increase in sales may be that customers are highly driven by taste when it comes to traditionally indulgent dishes such as pizza. When ordering in a busy restaurant, customers' impulses can influence them to pick an appealing and convenient option, causing hedonic appeal to override pre-existing biases against the flavours of plant-based food. Customers who may have tried vegan pizza for the first time could now expand their palettes and adopt a more environmentally friendly diet without directly intending to. However, a small effect size (0.032) suggests limited practical applications of this finding, indicating that indulgence-focused food promotion may not be a sufficient sole driver for diet changes.

Across this study, many limitations and potential confusion could have impacted the results. Firstly, the plant-based pepperoni used for the vegan pizza was sold out for the last few days of the baseline period. This setback may account for the baseline period's slightly lower percentage of vegan pizza sales. This ingredient delays also shorten the experimental period, potentially limiting the results further by reducing the sample size. Secondly, the poster promoting the vegan pizza was printed on A4 paper and not placed on the store's main poster board as intended. This likely reduced its visibility and effectiveness in attracting attention from potential customers. The short timeframe and single site setting at Mercante limited our ability to control external influencing variables.

Therefore, to more effectively compare whether indulgent framing increased sales, future studies could facilitate two experimental periods that each implement similarly designed posters promoting vegan pizza with different wording: indulgent vs health-focused or neutral framing to compare what people value more. This would control advertising being the sole factor for any sales increase, focusing more on framing effects. Further studies may also expand by measuring psychological mechanisms of consumer choice by conducting customer surveys or interviews to provide more insightful implications for vegan food perception. Lastly, the limited timeframe of the experiment prevented us from observing long-term impacts. The boost in sales may have been a short spike, possibly followed by stability in typical purchases. Conducting a lengthier experiment would provide more elaborate results that better represent standard buying patterns.

Despite finding a small significant effect, we hope that our study contributes and builds on consumer research for vegan food, providing a base for potentially new and improved studies that may adopt this experiment with enhanced designs. Generating more research can contribute to a trend of shifting diet patterns to reduce meat consumption, ultimately helping reduce GHG emissions (Aleksandrowicz et al. 2016).

Recommendations

This study has contributed to the UBC food service's goal of increasing sales of climate-friendly meals, conceptualized as meals that contain minimal animal products. Our client has observed a notable disinterest in sustainable dining options from their customer base, attributed to an unappealing perception of plant-based meals. To pursue a reduction in Scope 3 GHG emissions at UBC, our clients requested a set of promotional strategies and menu revamp ideas that are proven significant in increasing uptake of sustainable meal options. In light of our poster intervention having a positive impact on the proportion of vegan pizzas sold as compared to total sales, we recommend implementing the name change from "Vegan Special" to "Pepperoni Giardino," as well as a focus on taste-based marketing and descriptors on all signage depicting the vegan pizza option. Notably, the name change improves brand alignment of the vegan option, as before the name did not match the aesthetic of the other pizza options. We provide our poster as a baseline from which Mercante can continue taste-focused framing of climate-friendly options, and recommend a continued focus on putting pictures of toppings, evocative taste-baste descriptors, and vivid images of vegan options that look appetizing.

In terms of the purchasing process, we also recommend developing strategies for improving customer service regarding the climate-friendly meal purchasing process. During our experimental period, we encountered pushback from Mercante staff when purchasing the Vegan Special. To this end, we recommend vegan option sensitivity training to ensure customers do not feel discouraged from pursuing climate-friendly options. Furthermore, during our poster creation process, we received two notably different pizzas when ordering the vegan option. At first, we received a pizza of a small, oval shape, with uneven toppings and a general unrefined aesthetic. It was only when we requested a pizza to be made for marketing reasons that we received a pizza that we felt matched Mercante's standards for a quality pizza. We would recommend ensuring the process of pizza creation is standardized to ensure all customers have a quality experience with vegan options, otherwise, they may be discouraged from pursuing climate-friendly options in the future.

We note that though our results are significant, they have a very small effect size, meaning the poster only increased the proportion of vegan pizzas by a small margin. We feel that to truly shift dietary patterns of customers, we need to support initiatives that fight to change oppressive food systems that are inherently built on exploitation, environmental harms, and are entrenched in capitalistic systems of harm that legitimise unsustainable production (Gonzalez, 2015; Austin, 2017). For example, on the UBC campus, Sprouts (vegan) and Agora (vegetarian) are two student-run cafe initiatives that focus on local, climate-friendly food options while building community around shared meals. These initiatives build solidarity among patrons, and also act as political agents who fight for change in systemic injustices, such as the degradative land use that comes from industrialized farming and the disruption of Indigenous food systems imposed by settler-colonialist regimes (Whyte, 2015; Dennis and Robin, 2020; Malli et al., 2023). We hope to see continued support from UBC staff toward the success of these programs, as they are essential when moving toward food justice and climate justice.

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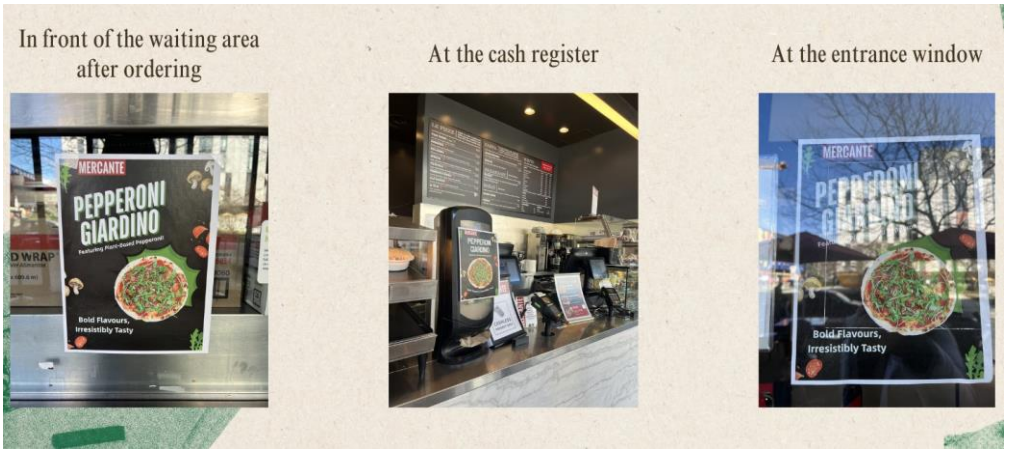
Appendix A: Promotional Poster

Appendix B: Contingency Table

	Net quantity of Vegan Feature Pizza	Net quantity of other pizzas
Baseline: Jan 1 - March 12th	136 (2%)	6577 (98%)
Experimental: March 13 - April 4th	83(3%)	2601(97%)

Appendix C: Intervention



Appendix D: Contributions of each Team Member

Brie Beaudry was the client coordinator, responsible for maintaining correspondence with the clients to ensure communication, and to request data on the needed dates. She collaborated with the team to write the introduction to the proposal, specifically doing the literature review, and also contributed to editing and formatting the other sections. Brie conceptualized, designed, and created the posters used as experimental material. She led the project discussion meeting. Brie also led the design of the PowerPoint presentation and wrote the research question and hypothesis. Brie was responsible for collaborating on the introduction, writing the first half, and also writing the client recommendation section of the final report.

Saanya Madhuk played a key role in conceptualizing the study and was responsible for helping to develop the original research idea. She was responsible for coordinating with Mercante to facilitate data collection and oversee the implementation of the poster intervention. She collaborated closely with the team in writing the Methods section, with a

particular focus on the Participants and Conditions subsections. Saanya also played a key role in designing the promotional poster, contributing to image selection, layout, and formatting. As one of the group presenters, she was also responsible for delivering the Conditions portion of the presentation.

Ninoshka Desilva took responsibility for coordinating the team by consistently managing and reminding members of due dates and role fulfillment. She was involved in the key brainstorming of the research question. For the proposal, she wrote the methods section focusing on the entire experimental design. She proofread and edited the proposal and final report. She focused on the psychological implications of the study by taking the initiative to write the discussion section of the final report. As one of the presenters, she wrote and shared the implications of preliminary findings with the class, as well as shared recommendations directly to the clients.

Jazzy Wan contributed to the development of the research proposal by narrowing down the research question and hypothesis, documenting citations, and took part in conducting literature reviews to support the study's conceptual vision. For the research presentation, she designed the title page, "Experimental Conditions" and "Measures" slides and was one of the presenters on presentation day. In the final report, she wrote the executive summary and contributed to a portion of the background literature and citations. To add a visual layer to the study, although it was not used as the final image of the poster, but was featured in the presentation to demonstrate the inconsistent presentation of the Vegan Feature pizza; she visited Mercante to capture imagery of the dish for documentation purposes.

Jena Arianto played a crucial part in the development of the research proposal by clearly defining the participant criteria and justifying the sample size through a chi-square analysis conducted during lecture. She collaborated closely with the team to write the Methods section of the final report, focusing on detailing the measures and describing the study's procedure comprehensively. In addition, she contributed to the visual aspects of the project by assisting with the selection of elements and graphics for the promotional poster design.

Aysha Karadalieva made a significant contribution to the project by independently managing the statistical analysis. She calculated all the statistics and derived the results. Additionally, she represented the group at the statistics meeting, ensuring that all aspects were on track during the progress check-in. As one of the group presenters, she was responsible for delivering the Results section. Throughout the project, she collaborated closely with the team during meetings and check-ins held at Mercante.