THE GOOD FOOD INSTITUTE

Consumer Perceptions of Plant-based Descriptor Terms

February 2019

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Executive summary

The purpose of this research project was to better understand the impact of language choice for describing plant-based meat. We examined the impact of descriptor terms on consumers' attitudes and behavioral intentions using the context of a plant-based burger. The research project included three study phases: 1) a survey assessing appeal ratings of descriptor words and a pilot experiment, 2) an experiment testing the effect of four different descriptor words, and 3) a replication of Phase 2 without the use of an image. The tested outcomes included appeal, sensory properties, identity congruence, likelihood of trying, and likelihood of purchasing.

Phase 1 Key Results:

- Consumers rated words that use the word "protein" and "plant-based" highest in appeal.
- In a pilot experiment, the use of a certified plant-based seal performed better than a certified vegan seal and a control group. The differences were small and not statistically significant.

Phase 2 Key Results:

- The Phase 2 experiment compared four descriptor words, "vegan", "plant protein", "meatless", and "plant-based". Both the descriptive and inferential statistics suggested that the use of descriptor terms had very little effect on the outcomes. Purchase intent was slightly lower when the term "meatless" was used, but again, the effect was small and not statistically significant.

Phase 3 Key Results:

- Phase 3 replicated Phase 2, but eliminated the use of the photo. We did not find a difference in effect of the descriptor terms as a result of using the photo.

Exploratory Analyses:

- We combined the Phase 2 and 3 data sets to conduct exploratory analyses to identify demographic characteristics of early adopters. Compared to the overall sample, the high purchase intent group contained higher percentages of those who reported identifying as flexitarian/vegetarian/vegan, those actively reducing meat consumption, and those who regularly consumed plant-based meat alternatives. In terms of demographic traits, the high purchase intent group had slightly higher percentages of millennials, females, and liberals. Only the dietary characteristics were statistically significant predictors of purchase intent. The results suggest that early adopters are best characterized by their dietary status (i.e., meat reducer), rather than their demographic characteristics.

Within the context of these studies, the normal use of descriptor words within text did not appear to have a very strong causal effect on key outcomes, at least when consumers are not consciously considering the use of the term. In Phase 1, where consumers were asked to actively consider the appeal of descriptors, results differed and consumers preferred terms that used "plant-based "and "plant protein" over "meatless" and "vegan". Considering the results of both study phases, we think it is likely most advantageous to use "plant-based" and "protein" terms, but the effect in real life may not be as dramatic as the Phase 1 survey research suggested. As a next step, we would like to see descriptor words tested on product packages and/or on menus, as these contexts may provide more realistic circumstances for consumers' decision making.

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Introduction

Language choice is an important factor for shifting consumers' attitudes and behavior toward more sustainable food choices (Wise, Vennard, & Bacon, 2018). This is especially true towards plant-based foods that directly substitute for meat. The U.S. market is undergoing rapid growth in the plant-based market sector (GFI, 2019), making it crucial to conduct applied research in this area and understand the best terminology for describing these products.

There have been a few studies in recent years that have sought to identify the most effective terminology for plant-based foods. In terms of how to generally label plant-based food products to increase widespread appeal, findings in this area have been mixed. Two survey studies have indicated that consumers rate products labeled as "plant-based" higher than those labelled as "vegan" or "vegetarian" (GFI, 2016; Watson, 2018).

On the other hand, a recent choice experiment identified "vegan" and non-traditional labels (e.g., "feel good") as sounding better to consumers (Anderson, 2019). In the restaurant setting, manipulating the names of plant-based menu items has shown to influence both consumers' preference toward and choosing of that menu item in an ecologically valid setting (Bacon, Wise, Attwood, & Vennard, 2018; Vennard, Park, & Attwood, 2018). These findings indicate that overall language impacts consumers' plant-based choices.

The objective of this research project was to examine the impact of descriptor terms on consumers' attitudes and behavioral intentions. The research project included three study phases: 1) a survey assessing appeal ratings of descriptor words, 2) an experiment testing the effect of four different descriptor words, and 3) a replication of Phase 2 without the use of an image. The appendices provide more detailed information, including the full surveys and demographic information. The project and its raw data are registered on Open Science Framework.

Phase 1: Survey

Phase 1 Method

Overview

The purpose of the Phase 1 survey was to test consumer appeal of various terms used to describe plant-based meat. We evaluated a set of 12 words for their consumer appeal with the purpose of narrowing down the list for the experiment in Phase 2.

Procedure

Participants began the survey by viewing a photograph of “a new type of burger” and then read a brief product description (see Figure 1). Next, participants rated a series of 12 randomly presented descriptor words in terms of their appeal. An attention check measure followed the outcome measures.

Figure 1. A new type of burger

This new type of burger is made entirely from plants and has no animal ingredients. It looks, tastes, and cooks just like conventional meat. It is produced using plant ingredients like proteins, fats, and carbohydrates to mimic the structure of conventional meat. These new burgers have recently become widely available at grocery stores and restaurants.

Next participants were randomly assigned to view a package of plant-based beef crumbles with either a certified plant-based seal, a certified vegan seal, or no seal. Participants then provided ratings of appeal, sensory properties, willingness to try, and purchase intent.

Figure 2. Package images for the Seal Experiment

Finally, participants were asked to provide demographic information. Participants received $0.75 compensation for participating in the 5-minute study.

Sample

The sample was obtained from Amazon Mechanical Turk via the Positly Platform. Participants were matched by age and gender groups to the general U.S. population. All participants met Positly's screening procedures, including (a) passing approval rate and experience thresholds, (b) reporting a country that matched one's IP address, (c) disallowing suspicious IP addresses, and (d) passing the attention check threshold.

Four participants were removed due to missing data. All other participants passed an attention check embedded in the survey and remained in the sample. The final sample size was 305. Appendix A shows the full demographic characteristics for each phase of the project.

Measures

Participants were asked to indicate the degree to which they personally found each word appealing. Appeal was measured on a 5-point semantic differential scale, from "unappealing to me" to "appealing to me".

After viewing one of three product images, participants responded to a series of questions asking about the product's overall appeal and sensory expectations, as well as their own likelihood of trying and purchasing the product. All scales achieved good reliability. Reliability coefficients for the scales can be found in Appendix B.

Participants also provided their demographic and dietary information. See Appendix C for the full Phase 1 Survey.

Phase 1 Results

Phase 1 Results - Appeal of Descriptor Terms

Table 1 shows the mean appeal ratings for each descriptor term in descending order. Terms that used the word "protein" and "plant-based" tended to score highest.

Table 1. Appeal ratings

Descriptor term	Appeal	
	M	SD
Plant protein	3.63	1.27
100% plant-based	3.51	1.39
Plant-based	3.49	1.32
Direct protein	3.42	1.28
Animal-free	3.40	1.39

Plant-powered	3.20	1.39
Meatless	3.19	1.40
Meat-free	3.07	1.43
Meat alternative	3.07	1.38
Vegan	2.95	1.45
Plant-based meat	2.83	1.41
Meat substitute	2.69	1.39

Phase 1 Results - Pilot Seal Experiment

To get a sense of potential market success, we first examined the percentage of participants who rated each of the outcome variables as greater than neutral on the 5-point scales (see Table 2). Overall, "Certified Plant-based" achieved the highest percentages of positive outcomes (49% purchase intent), followed by the "No seal" condition (46% purchase intent), and then the "Certified Vegan" condition (35% purchase intent). While these results are informative, the inferential statistical analysis did not find a statistical difference between the terms (see Table 3).

Table 2. Pilot Seal Experiment - Percentage of Participants with Positive Outcomes

		Certified Vegan	Certified Plant-based	No Seal	Total
	n	84	108	113	305
Product Attributes*	Overall Appeal	45%	63%	54%	55%
	Taste**	45%	59%	54%	53%
Behavioral Intentions*	Likelihood of Trying	55%	68%	55%	59%
	Likelihood of Purchasing	35%	49%	46%	44%

Notes. *For attributes, the percentages report participants who strongly or somewhat agreed with the statement. For behavioral intentions, the percentages report participants who definitely or probably would try/buy the product.
**Sensory properties were originally measured as a scale. Reported in this table is one item from the sensory scale, "I expect that this product would taste very good.

Next, we ran a one-way between subjects Analysis of Variance (ANOVA) for each outcome variable (see Table 2). None of the omnibus ANOVAs were statistically significant ($p < .05$), and no post hoc analyses were performed. Table 3 shows the means and standard deviations for each outcome variable.

Table 3. Pilot Seal Experiment - One-way Analysis of Variance

		Omnibus Tests				
		df	*F*	*p*	*Partial* η^2	*Power*
Product Attributes	Overall Appeal*	2, 302	2.80	.06	.02	.55

	Sensory Properties	2, 302	2.22	.11	.01	.45
Behavioral Intentions	Likelihood of Trying	2, 302	2.70	.07	.02	.53
	Likelihood of Purchasing	2, 302	2.20	.11	.01	.45

Table 4. Pilot Seal Experiment - Means and standard deviations for outcome variables

		Certified Vegan		Certified Plant-based		No Seal	
		M	SD	M	SD	M	SD
Product Attributes	Overall Appeal	3.13	1.13	3.52	1.20	3.39	1.08
	Sensory Properties	3.22	1.11	3.54	1.09	3.44	0.98
Behavioral Intentions	Likelihood of Trying	3.33	1.33	3.73	1.24	3.43	1.23
	Likelihood of Purchasing	2.92	1.33	3.31	1.34	3.17	1.26

Note. Each outcome was rated on a 1-5 scale, where lower scores indicate a negative rating and higher scores indicate a positive rating. The full description of measures can be found in Appendix I.

Phase 1 Conclusions

Given their current use in the marketplace, we began the project knowing that we wanted to test the terms “plant-based”, “vegan”, and either “meat-free” or “meatless” in Phase 2. Based on its higher appeal rating in Phase 1, we opted to test “meatless” over “meat-free.” We also selected the highest scoring term, “plant-protein”, for further testing. As such, four descriptors were ultimately chosen for inclusion in the Phase 2 experiment: “plant-based”, “vegan”, “meatless”, and “plant protein”.

Additionally, we included in Phase 1 a pilot experiment comparing the two types of seals (plant-based and vegan) to a control group (no seal) in order to determine whether the results warranted further research. While not statistically significant, the certified plant-based seal obtained higher means than both the certified vegan seal and no seal conditions. However, we should very cautiously interpret these results, as participants were primed to think about the appeal of various descriptor terms prior to the randomized seal experiment portion of the study. The results suggest that further research will be useful, and we suggest repeating the test using a larger sample, as well as without priming participants to first think about the appeal of descriptors.

Phase 2: Experiment

Phase 2 Method

Overview

The purpose of the Phase 2 experiment was to test the outcomes associated with four different terms

used to describe plant-based meat. Participants were randomly assigned to view a photograph accompanied by a description of the product, in which the product was referred to as a "vegan burger", "plant protein burger", plant-based burger", or "meatless burger".

Procedure

Participants began the study by viewing a photograph of "a new [pipe text] burger". The pipe text was either "vegan", "plant protein", plant-based", or "meatless", depending on the randomized condition. Participants then read a brief product description. See Figure 3 for the product image and description.

Figure 3. Product Image and Description

A new [pipe text] burger

This [pipe text] *burger is made entirely from plants and has no animal ingredients. It looks, tastes, and cooks just like conventional meat. It is produced using plant ingredients like proteins, fats, and carbohydrates to mimic the structure of conventional meat. These new* [pipe text] *burgers have recently become widely available at grocery stores and restaurants.*

Next, participants responded to a series of questions asking about the product's overall appeal and sensory expectations, as well as their own identification with the product, likelihood of trying the product, and likelihood of purchasing the product. An attention check measure followed these outcome measures. Finally, participants were asked to provide demographic information. Participants received $0.75 compensation for participating in the 5-minute study.

Sample

The sample was obtained from Amazon Mechanical Turk via the Positly Platform. Participants were matched by age and gender groups to the general US population. All participants met Positly's screening procedures, including passing approval rate and experience thresholds, country matching the IP address, disallowing suspicious IP addresses, and passing the attention check threshold.

Seven participants were removed due to missing data, four were removed due to failing an attention check, and 37 were removed due to insufficient duration (the cutoff time was 50% of the median duration). All other participants remained in the sample. The final sample size was 771. Appendix A

shows the full demographic characteristics of the Phase 2 sample.

Measures

Participants responded to a series of questions asking about the product's overall appeal, sensory expectations, as well as their own identification with the product, likelihood of trying the product, and likelihood of purchasing the product. Each of these outcomes were measured on a five-point scale and achieved good reliability (see Appendix B for reliability coefficients). An attention check measure followed the outcome measures. Finally, participants provided their demographic and dietary information. Appendix D shows the full survey and measures.

Phase 2 Results

To get a sense of potential market success, we first reported the percentage of participants scoring greater than neutral on the 5-point scales for each of the outcome variables (see Table 5). Overall, differences between groups were minimal in terms of overall product appeal, taste expectation, and likelihood of purchasing. The descriptor terms "plant-protein" (49% purchase intent), "plant-based" (48% purchase intent) and "vegan" (46% purchase intent) achieved slightly better percentages than "meatless" (41% purchase intent). However, these differences were not found to be statistically significant (see Table 6).

Table 5. Phase 2 Percentage of Participants with Positive Outcomes

		Vegan	Plant protein	Meatless	Plant-based	Total
Product Attributes*	Overall Appeal	68%	59%	55%	68%	62%
	Taste**	63%	58%	52%	62%	62%
	Identity**	32%	30%	29%	29%	62%
Behavioral Intentions*	Likelihood of Trying	69%	68%	67%	70%	68%
	Likelihood of Purchasing	46%	49%	41%	48%	46%

Notes. *For attributes, the percentages report participants who strongly or somewhat agreed with the statement. For behavioral intentions, the percentages report participants who definitely or probably would try/buy the product.
**Sensory properties and Identity were each originally measured as scales. Reported in this table is one item from the sensory scale, "I expect that this product would taste very good" and one item from the identity scale, "This product reflects who I am".

Next, we ran a one-way between subjects Analysis of Variance (ANOVA) for each outcome variable. None of the omnibus ANOVAs were statistically significant ($p < .05$), and no post hoc analyses were performed. Table 6 shows the ANOVA results and Table 7 shows the means and standard deviations for each outcome variable.

Table 6a. Phase 2 ANOVA Results

	Omnibus Tests				
	df	*F*	*p*	*Partial* η^2	*Observed Power*

Product Attributes	Overall Appeal*	3,767	2.38	.07	.01	.58
	Sensory Properties	3,767	1.82	.14	.01	.47
	Identity	3,767	1.25	.30	.01	.34
Behavioral Intentions	Likelihood of Trying	3,767	0.16	.92	<.01	.08
	Likelihood of Purchasing	3,767	0.55	.65	<.01	.16

Note. Appeal failed the homoscedasticity assumption (p = .02); however, a Welch test obtained similar results (p = .08).

Table 6b. Phase 2 Means and standard deviations for outcome variables

		Vegan		Plant protein		Meatless		Plant-based	
		M	SD	M	SD	M	SD	M	SD
Product Attributes	Overall Appeal	3.57	1.12	3.41	1.19	3.30	1.24	3.56	1.14
	Sensory Properties	3.53	1.05	3.38	1.01	3.32	1.11	3.50	1.02
	Identity	2.92	1.25	2.92	1.27	2.80	1.19	3.05	1.19
Behavioral Intentions	Likelihood of Trying	3.80	1.22	3.82	1.25	3.77	1.25	3.85	1.28
	Likelihood of Purchasing	3.12	1.34	3.18	1.31	3.04	1.33	3.20	1.30

Note. Each outcome was rated on a 1-5 scale, where lower scores indicate a negative rating and higher scores indicate a positive rating. The full description of measures can be found in Appendix D.

Phase 2 Conclusions

Both the descriptive and inferential statistics suggested that the use of descriptor terms had very little effect on the outcomes, including purchase intent. Purchase intent was slightly lower when the term “meatless” was used, but again, the effect was small and not statistically significant.

In Phase 2, the descriptor term was embedded in a message that included an appealing image and description of the burger. It was possible that exposure to the image overwhelmingly cued taste and convoluted the descriptor term’s effect. Thus, we decided to conduct a third Phase in order to determine if the results of the Phase 2 experiment would replicate without the use of a photo.

Phase 3

Phase 3 Method

Phase 3 was designed to replicate the Phase 2 experiment, while removing any potential effect from the image. As such, we replicated Phase 2 procedures. In Phase 3, however, all message conditions

contained solely text. Measures remained the same, with one exception. After completion of outcome measures, participants were asked two quality check questions. These quality checks included a question asking whether they read the product description, and if they did, a question asking them the name of the product (vegan, plant protein, meatless, plant-based, don't know). To retain the ability to compare Phase 2 and 3, these additional quality check measures were intended only for use in subsequent exploratory analyses.

Because the purpose of Phase 3 was to assess a possible effect of including the burger image, we recruited a smaller sample (N = 396). Twenty-seven participants were removed due to missing data, zero were removed due to failing an attention check, and 10 were removed due to insufficient duration (the cutoff was the same as Phase 2). All other participants remained in the sample. Appendix A shows the full demographic characteristics of the Phase 3 sample, and Appendix E shows the entire Phase 3 survey and measures.

Phase 3 Results

To get a sense of potential market success, we first reported the percentage of participants scoring greater than neutral on the 5-point scales for each of the outcome variables (see Table 7). Overall, the study replicated the Phase 2 findings: differences between groups were minimal in terms of overall product appeal, taste expectation, and likelihood of purchasing. The descriptor terms "plant-protein" (43% purchase intent), "plant-based" (39% purchase intent) and "vegan" (41% purchase intent) achieved slightly better percentages than "meatless" (32% purchase intent), though again none of these differences were statistically significant.

Table 7. Phase 3 Percentage of Participants with Positive Outcomes

		Vegan	Plant protein	Meatless	Plant-based	Total
		N = 98	N = 97	N = 102	N = 99	N = 396
Product Attributes*	Overall Appeal	59%	62%	51%	60%	58%
	Taste**	52%	56%	48%	54%	52%
	Identity**	30%	35%	18%	34%	29%
Behavioral Intentions*	Likelihood of Trying	67%	73%	67%	71%	69%
	Likelihood of Purchasing	41%	43%	32%	39%	39%

Notes. *For attributes, the percentages report participants who strongly or somewhat agreed with the statement. For behavioral intentions, the percentages report participants who definitely or probably would try/buy the product.
**Sensory properties and Identity were each originally measured as scales. Reported in this table is one item from the sensory scale, "I expect that this product would taste very good" and one item from the identity scale, "This product reflects who I am".

Next, we ran a one-way between subjects Analysis of Variance (ANOVA) for each outcome variable. All omnibus ANOVAs were not statistically significant ($p < .05$), and no post hoc analyses were performed. Table 8 shows the ANOVA results and Table 9 shows the means and standard deviations for each outcome variable.

Table 8. Phase 3 ANOVA Results

		Omnibus Tests				
		df	*F*	*p*	*Partial* η^2	*Observed Power*
Product Attributes	Overall Appeal*	3, 392	0.73	.54	< .01	.21
	Sensory Properties	3, 392	0.68	.57	< .01	.19
	Identity	3, 392	1.84	.14	.01	.45
Behavioral Intentions	Likelihood of Trying	3, 392	1.24	.30	.01	.33
	Likelihood of Purchasing	3, 392	0.38	.77	< .01	.13

Note. Likelihood of trying failed the homoscedasticity assumption (p = .03); however, a Welch test obtained similar results (p = .30).

Table 9. Phase 3 Means and standard deviations for outcome variables

		Vegan		Plant protein		Meatless		Plant-based	
		M	SD	M	SD	M	SD	M	SD
Product Attributes	Overall Appeal	3.41	1.19	3.44	1.15	3.25	1.22	3.48	1.17
	Sensory Properties	3.33	1.00	3.41	0.96	3.25	1.07	3.43	1.00
	Identity	2.95	1.23	3.02	1.33	2.66	1.18	3.01	1.27
Behavioral Intentions	Likelihood of Trying	3.83	1.21	3.96	1.05	3.67	1.30	3.92	1.09
	Likelihood of Purchasing	3.17	1.22	3.10	1.19	2.99	1.29	3.12	1.30

Note. Each outcome was rated on a 1-5 scale, where lower scores indicate a negative rating and higher scores indicate a positive rating. The full description of measures can be found in Appendix I.

Although all but one participant said they read the description, 28% (n = 109) of participants were unable to accurately recall the name of the burger used in their randomized message when provided with a list of possible names. As an exploratory analysis, we re-ran a second set of ANOVAs after eliminating those with inaccurate recollections. The results remained largely the same, with the pattern of means suggesting that "vegan", "plant protein", and "plant-based" performed better than "meatless,". However, the omnibus ANOVA was only significant for identity, F(3, 283) = 3.05, p= .03. All other outcome variables were not significant (appeal, F(3, 283) = 1.85, p= .14; sensory properties, F(3, 283) = 1.24, p= .29; likelihood of trying, F(3, 283) = 1.33, p= .26; likelihood of purchasing, F(3, 283) = 1.08, p= .36).

Phase 3 Conclusions

The means and effect sizes were similar in Phase 2 and 3. These findings suggest that the use of various descriptor terms was not overshadowed by the inclusion of the appealing image.

Exploratory Analyses – Purchase Intent

For exploratory analyses, we combined the Phase 2 and Phase 3 datasets. We made this decision because (a) we did not find an effect of using the photo, (b) the questions were identical across both phases, (c) the respondents were unique participants, and (d) data collection between the two studies occurred within four weeks of each other.

Phase 3 included an additional quality check (which followed the outcome measures). Because Phase 2 did not have this quality check, we did not use this additional quality check as an inclusion criterion.

Profile of Early Adopters

In order to understand the demographic and dietary profile of early adopters, we compared those with high purchase intent (very or extremely likely to purchase; n = 509) with the full sample (n =1,167). In terms of diet, the high purchase intent group contained higher percentages of those who reported identifying as flexitarian/vegetarian/vegan, those actively reducing meat consumption, and those who regularly consumed of plant-based meat alternatives. In terms of demographic traits, the high purchase intent group had slightly higher percentages of Millennials, females, liberals, Hispanics, African-Americans, and Asian-Americans. Region, education, and household income were not key factors differing between the early adopter and overall sample. It's important to note that although the data trended in these directions, there was wide appeal across all of the demographic and dietary characteristics. That is to say, plenty of omnivores, boomers, conservatives, and males expressed high purchase intent, too. Moreover, differences across these groups were not statistically significant (see predictors of purchase intent below), and thus should be re-tested in future studies. See Appendix F for a table showing the comparison of these two groups.

Predictors of Purchase Intent

A multiple regression analysis was conducted to assess the ability of dietary and demographic variables to predict purchase intent (two ordered sets of predictors). The first set of predictors included the dietary measures: frequency of meat consumption, frequency of meat reduction, and frequency of meat substitute consumption. The second set of predictors included the demographic variables: age, gender, household income, education, and political orientation. The dietary predictors accounted for a significant amount of purchase intent variability, $R^2 = .27$, $F(3, 1163) = 146.03$, $p < .001$. This indicated that those who were eating less meat, $\beta = -.21$, $t(1163) = -7.34$, $p < .001$), reducing meat consumption, $\beta = -.10$, $t(1163) = -3.76$, $p < .001$, and eating more meat substitutes, $\beta = .37$, $t(1163) = 13.56$, $p < .000$, tended to have higher purchase intent scores. A second analysis was conducted to evaluate whether demographic measures predicted purchase intent over and above dietary measures. The set of demographic measures was not significant, R^2 change = .004, $F(5, 1158) = 1.33$, $p = .25$. Based on these results, the demographic measures appear to have very little predictive power beyond that contributed by dietary measures.

Project Conclusions

The purpose of this research project was to better understand the impact of language choice for describing plant-based burgers. Phase 1 reported consumer appeal ratings for twelve descriptor terms, where terms with the words “protein” and “plant-based” tended to score highest. Phase 2 was an experiment testing four descriptor words, “vegan”, “plant protein”, “meatless”, and “plant-based”. Overall, descriptive statistics indicated very little differences between terms, though “meatless” performed slightly worse than the other descriptors. Similarly, inferential statistics indicated no significant differences between groups, extremely small effect sizes, and very similar group means. Primary strengths of the Phase 2 study include the experimental design and a large sample size. We cannot conclude that there was any meaningful effect of the four descriptor terms on key outcome variables, including purchase intent.

Phase 3 replicated Phase 2, but eliminated the use of the photo. We did not find a difference in effect of the descriptor terms as a result of using the photo. However, purchase intent was higher in Phase 2 compared to Phase 3, which suggests that an appealing photo may influence important driver of overall purchase intent, though, again, this finding was not statistically significant and is thus not conclusive.

In the Phase 2 study, participants were presented with an appealing photograph of a prepared plant-based burger, along with a brief product description. While the accompanying message provided key information to the consumer, images of a product package (rather than the prepared product) may better replicate a point of purchase decision in a grocery store. Future studies could assess the impact of descriptor terms on product packages.

On Phase 3, over ¼ of respondents were unable to correctly recall the name of the burger from their randomized condition. On one hand, this suggests that a stronger manipulation would have likely resulted in significant results. A stronger manipulation might have been accomplished by bolding or underlining the term, repeating the description on each page, and using the word within the question texts. On the other hand, we are interested in real life application, and so it may not be useful to exaggerate the effect.

Within the context of these studies, we conclude that the normal use of descriptor words within text does not appear to have a very strong effect, at least when consumers are not consciously considering the use of the term. In Phase 1, where consumers were asked to actively consider the appeal of descriptors, results differed and consumers preferred terms that used “plant-based “and “plant protein” over “meatless” and “vegan”. When deciding which descriptor term to use on product packages, we suggest that marketing professionals default to “plant-based” and “plant protein” terminology. However, it is best practice to consider adjusting terminology after first assessing the target demographic.

Considerations for future research

The results of the study varied between the survey research and experimental research. The survey was useful in gaining consumers’ conscious assessment of the terms’ appeal. However, the experiment was useful in gaining insight into consumers’ decision-making when they are less consciously assessing these

terms. Taken together, we think it is likely the most advantageous to use “plant-based” and “protein” terms, but the effect in real life may not be as dramatic as the survey research suggested. For future research, we recommend a mixed methods approach, with more reliance placed on experimental research. Stronger message manipulations may be useful, as well as repetition of descriptions on each page, and customizing question text to include the randomized descriptor word. Additional quality checks (e.g., testing for having read the description) may also reduce error.

As a next step, we would like to see descriptor words tested on product packages and/or on menus, as these contexts may provide more realistic circumstances for decision making. If preliminary online studies point in a useful direction, we recommend following up with studies in real-life settings and measuring actual behavior.

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About the Good Food Institute

The Good Food Institute is a 501(c)(3) nonprofit organization dedicated to creating a healthy, humane, and sustainable food supply. GFI's team of scientists, entrepreneurs, lawyers, and lobbyists are laser focused on using markets and food innovation to transform our food system away from industrial animal agriculture and toward plant-based and clean meat alternatives. To learn more, please visit GFI.org.

About the Author

At GFI, Dr. Keri Szejda's research advances the plant-based and cultivated meat market sectors by generating effective messaging that helps consumers make sustainable, healthy, and just food choices. She is also a Visiting Scholar with the School of Social and Behavioral Sciences at Arizona State University (ASU). Keri earned her Ph.D. in Communication from ASU's Hugh Downs School of Human Communication and completed postdoctoral work in Science Communication with ASU's School for the Future of Innovation in Society.

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Suggested Citation

Szejda, K. (2019). Consumer perceptions of plant-based descriptor terms. Research Report. Washington, DC: The Good Food Institute. Available at plant-based-terms-consumer-perception

Acknowledgements

The Good Food Institute is a 501(c)(3) nonprofit organization. We are powered by philanthropy, relying on gifts and grants from our family of supporters to fulfill our mission.

Appendix A: Phase 1, 2, and 3 Demographics

Demographic Characteristics for Each Study Phase

	Phase 1 N = 305		Phase 2 N = 771		Phase 3 N = 396	
Demographic Characteristic	%	n	%	n	%	n
Gen Y/Millennial (18-37)	38.7	118	37.6	290	39.9	158
Gen X (38-53)	29.8	91	29.8	230	28.5	113
Baby Boomer (54-72)	31.5	96	32.6	251	31.6	125
Gender						
Male	48.9	149	48.9	377	48.7	193
Female	51.1	156	51.1	394	51.3	203
Non-binary/Other						
Race/Ethnicity (select all that apply)						
Hispanic, Latino, or Spanish	4.9	15	8.3	64	4.6	18
White or Caucasian	81.6	249	80.7	622	84.6	335
Black or African American	12.5	38	8.6	66	7.6	30
American Indian or Alaska Native	2.0	6	1.6	12	0.8	3
Asian	5.2	16	6.9	53	5.6	22
Middle Eastern or North African	0.3	1	0.3	2	0.3	1
Native Hawaiian or Other Pacific Islander	0.3	1	0.3	2	0.3	1
Other	0.3	1	0.8	6	0.3	1
Region						
Northeast	15.1	46	18.3	141	21.7	86
Midwest	19.7	60	21.7	167	20.2	80
South	42.8	130	38.1	294	36.1	143
West	22.4	68	22.0	169	22.0	87
Household income						
Less than $9,999	5.2	16	3.4	26	2.3	9
$10,000 to $24,999	17.7	54	14.8	114	16.2	64
$25,000 to $39,999	21.6	66	19.1	147	15.2	60
$40,000 to $59,999	23.6	72	22.0	169	22.7	90
$60,000 to $84,999	15.7	48	18.2	140	24.2	96
$85,000 to $114,999	6.6	20	13.0	100	11.1	44
$115,000 to $149,999	4.6	14	5.3	41	4.3	17

$150,000 to $199,999	4.3	13	2.5	19	2.8	11
$200,000 or more	0.7	2	2.0	15	1.3	5
Political views						
Very conservative	4.6	14	5.7	44	5.1	20
Conservative	21.1	64	21.3	164	23.0	87
Moderate	26.3	80	26.1	201	25.5	101
Liberal	27.6	84	32.2	248	31.8	126
Very liberal	20.4	62	14.5	112	15.7	62
Prefer not to answer			0.5	2		
Education						
Eighth grade or below; none	0	0	0.1	1	0.5	2
Completed only high school or the equivalent (for example: GED), no college	24.3	74	21.3	164	23.2	92
Completed trade/technical/vocational training	7.2	22	11.4	88	8.3	33
Completed associate degree only, no bachelor's degree (AA, AS or other)	18.0	55	17.6	136	12.6	50
Completed bachelor's degree (BA, AB, BS or other)	38.4	117	37.2	287	40.4	160
Completed master's degree (MA, MS, MEng, MEd, MBA, or other	9.2	28	9.3	72	12.1	48
Completed professional degree (JD, MD or other)	1.6	5	1.8	14	1.5	6
Completed doctorate degree (PhD, PsyD, EdD or other.)	1.3	4	1.2	9	1.3	5
Diet						
Omnivore	72.7	221	74.8	577	74.2	294
Pescatarian	2.0	6	18.0	139	16.4	65
Flexitarian	18.4	56	2.1	16	1.3	5
Vegetarian	4.9	15	3.5	27	5.1	20
Vegan	2.0	6	1.6	12	3.0	12
Meat consumption						
I never eat meat.	5.9	18	4.5	35	7.3	29
I rarely eat meat.	7.9	24	6.4	49	5.6	22
I sometimes eat meat.	28.0	85	26.1	201	25.5	101
I often eat meat.	39.1	119	42.7	329	42.4	168
I almost always eat meat.	19.1	58	20.4	157	19.2	76
Change in meat consumption after 1 year						
A lot less	9.9	30	6.5	50	9.1	36
Slightly less	22.7	69	22.6	174	23.0	91
No change	61.5	187	65.4	504	60.1	240

Slightly more	4.3	13	4.3	33	6.1	24
A lot more	1.6	5	1.3	10	1.3	5
Meat substitute consumption						
Rarely/never	47.4	144	48.6	375	45.2	179
Once every few months	17.8	54	18.2	140	18.7	74
Once a month	11.2	34	11.5	89	12.1	48
Once a week	10.2	31	10.1	78	12.9	51
Multiple times per week	11.5	35	9.3	72	7.8	31
Daily	2.0	6	2.2	17	3.3	13

Appendix B. Reliability Coefficients

		Number of Items	Phase 1 Seal Experiment N = 305	Phase 2 Descriptor Experiment N = 771	Phase 3 Descriptor Experiment N = 396
			α	α	α
Product Attributes	Overall Appeal	1	-	-	-
	Sensory Properties	4	.90	.91	.88
	Identity	3	-	.94	.95
Behavioral Intentions	Likelihood of Trying	1	-	-	-
	Likelihood of Purchasing	1	-	-	-

Appendix C. Phase 1 Survey

Phase 1:

At the start of the survey, you will see a product image and description. Please click to the next page and carefully view the image and description.

A new type of burger

This new type of burger is made entirely from plants and has no animal ingredients. It looks, tastes, and cooks just like conventional meat. It is produced using plant ingredients like proteins, fats, and carbohydrates to mimic the structure of conventional meat. These new burgers have recently become widely available at grocery stores and restaurants.

○ I have read the description of the burger and am ready to continue the survey.

First, you will see a series of twelve words that could be used to describe this type of burger.
For each word, please indicate the degree to which you personally find the word appealing.

	Not at all appealing	Somewhat appealing	Moderately appealing	Very appealing	Extremely appealing
Meatless	○	○	○	○	○
Meat-free	○	○	○	○	○
100% plant-based	○	○	○	○	○
Plant-based	○	○	○	○	○
Plant-based meat	○	○	○	○	○
Plant powered	○	○	○	○	○
Plant protein	○	○	○	○	○
Vegan	○	○	○	○	○
Animal-free	○	○	○	○	○
Direct protein	○	○	○	○	○
Meat Substitute	○	○	○	○	○
Meat Alternative	○	○	○	○	○

On the next page, you will see a similar meat product made entirely from plants. These crumbles can be used in familiar dishes like tacos or pasta.

The package will be displayed for 15 seconds only. Please spend that time becoming familiar with the package.

The page will auto-advance after the 15-second viewing period is over.

[Each participant was randomly assigned to view only one product package]

Overall, I expect that this product would be *very appealing*.

- ○ Strongly disagree
- ○ Somewhat disagree
- ○ Neither agree nor disagree
- ○ Somewhat agree
- ○ Strongly agree

I expect that this product would *taste very good.*

- ○ Strongly disagree
- ○ Somewhat disagree
- ○ Neither agree nor disagree
- ○ Somewhat agree
- ○ Strongly agree

I expect that this product would have an appealing *texture.*

- ○ Strongly disagree
- ○ Somewhat disagree
- ○ Neither agree nor disagree
- ○ Somewhat agree
- ○ Strongly agree

I expect that this product would have an appealing *smell.*

- ○ Strongly disagree
- ○ Somewhat disagree
- ○ Neither agree nor disagree
- ○ Somewhat agree
- ○ Strongly agree

I expect that this product would be very satiating/filling.

- ○ Strongly disagree
- ○ Somewhat disagree
- ○ Neither agree nor disagree
- ○ Somewhat agree
- ○ Strongly agree

How likely are you to try this product?

- ○ Definitely would not try it
- ○ Probably would not try it
- ○ Might or might not try it
- ○ Probably would try it
- ○ Definitely would try it

How likely are you to buy this product?

- ○ Definitely would not buy it
- ○ Probably would not buy it
- ○ Might or might not buy it
- ○ Probably would buy it
- ○ Definitely would buy it

This question just helps us know whether we are using quality data. It will not affect your participation in this study.

What were you doing 200 years ago?

- ○ I was not born.
- ○ I was working in a shipyard.
- ○ I was travelling the world.
- ○ I was watching a movie.

The last set of questions asks about your diet and demographic information.

Which category best describes your diet?

- ○ Omnivore (I eat meat, such as beef, pork, chicken, turkey, fish and/or shellfish
- ○ Flexitarian (I sometimes eat meat, but I often chose plant-based foods instead)
- ○ Pescatarian (I eat fish and/or shellfish, but no other types of meat)
- ○ Vegetarian (I don't eat meat of any kind, but I do eat eggs and/or dairy products)
- ○ Vegan (I don't eat meat, eggs, dairy products, or other animal-derived ingredients)

Which statement best describes your meat consumption?

- ○ I never eat meat.
- ○ I rarely eat meat.
- ○ I sometimes eat meat.
- ○ I often eat meat.
- ○ I almost always eat meat.

Compared to one year ago, how much meat are you eating now?

- ○ A lot less
- ○ Slightly less
- ○ No change
- ○ Slightly more
- ○ A lot more

Which statement best describes how frequently you consume meat substitutes? (for example, veggie burgers,

plant-based sausages/hot dogs, tofu, seitan)

- ○ Rarely/never
- ○ Once every few months
- ○ Once a month
- ○ Once a week
- ○ Multiple times per week
- ○ Daily

Which categories of race/ethnicity describe you? (Select ALL that apply)

- ○ Hispanic, Latino, or Spanish
- ○ White or Caucasian
- ○ Black or African American
- ○ American Indian or Alaska Native
- ○ South Asian (Indian Subcontinent)
- ○ Asian
- ○ Middle Eastern or North African
- ○ Native Hawaiian or other Pacific Islander
- ○ Other (specify): _____
- ○ Prefer not to answer

In which state do you currently reside?

▼ Alabama … I do not reside in the United States

How would you describe your political views?

- ○ Very conservative
- ○ Conservative
- ○ Moderate
- ○ Liberal
- ○ Very liberal

Appendix D. Phase 2 Survey

Greetings,

My name is Keri Szejda, and I am a Visiting Scholar in the School of Social and Behavioral Sciences at Arizona State University. I am conducting a research study about perceptions of a new food innovation. Your participation in this study may help inform the development of a new consumer product. There are no foreseeable risks or discomforts to your participation. Participation in this study involves answering survey questions. The survey will take about 5 minutes to complete. We will not ask your name or any other identifying information in this survey. For research purposes, an anonymous numeric code will be assigned to your responses. However, your Amazon MTurk worker ID number will be temporarily stored in order to pay you for your time; this data will be deleted as soon as it is reasonably possible. You have the option of making your personal information private by changing your MTurk settings through Amazon.

The results of this study may be used in reports, presentations, or publications. Your participation in this study is voluntary. You can skip questions if you wish. If you choose not to participate or to withdraw from the study at any time, there will be no penalty. You must be 18 or older to participate in the study. Compensation for participating in this study is $0.75. If you have any questions concerning the research study, please email me (keri.szejda@asu.edu) or Dr. Jeffrey Kassing (jkassing@asu.edu). If you have any questions about your rights as a subject/participant in this research, or if you feel you have been placed at risk, you can contact the Chair of the Human Subjects Institutional Review Board, through the ASU Office of Research Integrity and Assurance, at (480) 965-6788.

Sincerely,

Keri Szejda, PhD

If you wish to be part of the study, click "next".

To begin the survey, please carefully view the image and description below.

A new [pipe text] burger

This new [pipe text] burger is made entirely from plants and has no animal ingredients. It looks, tastes, and cooks just like conventional meat. It is produced using plant ingredients like proteins, fats, and carbohydrates to mimic the structure of conventional meat. These new [pipe text] burgers have recently become widely available at grocery stores and restaurants.

○ I have read the description of the [pipe text] burger and am ready to continue the survey.

Overall, I expect that this product would be *very appealing*.

- ○ Strongly disagree
- ○ Somewhat disagree
- ○ Neither agree nor disagree
- ○ Somewhat agree
- ○ Strongly agree

I expect that this product would *taste very good.*

- ○ Strongly disagree

- ○ Somewhat disagree
- ○ Neither agree nor disagree
- ○ Somewhat agree
- ○ Strongly agree

I expect that this product would have an appealing *texture.*

- ○ Strongly disagree
- ○ Somewhat disagree
- ○ Neither agree nor disagree
- ○ Somewhat agree
- ○ Strongly agree

I expect that this product would have an appealing *smell.*

- ○ Strongly disagree
- ○ Somewhat disagree
- ○ Neither agree nor disagree
- ○ Somewhat agree
- ○ Strongly agree

I expect that this product would be very satiating/filling.

- ○ Strongly disagree
- ○ Somewhat disagree
- ○ Neither agree nor disagree
- ○ Somewhat agree
- ○ Strongly agree

This product is compatible with the image I have of myself.

- ○ Strongly disagree
- ○ Somewhat disagree

- ○ Neither agree nor disagree
- ○ Somewhat agree
- ○ Strongly agree

This product reflects who I am.

- ○ Strongly disagree
- ○ Somewhat disagree
- ○ Neither agree nor disagree
- ○ Somewhat agree
- ○ Strongly agree

This product is for me.

- ○ Strongly disagree
- ○ Somewhat disagree
- ○ Neither agree nor disagree
- ○ Somewhat agree
- ○ Strongly agree

I would try this product if somebody gave it to me.

- ○ Strongly disagree
- ○ Somewhat disagree
- ○ Neither agree nor disagree
- ○ Somewhat agree
- ○ Strongly agree

I would be very interested in trying this product.

- ○ Strongly disagree
- ○ Somewhat disagree
- ○ Neither agree nor disagree

- ○ Somewhat agree
- ○ Strongly agree

How likely are you to *try* this product?

- ○ Definitely would not try it
- ○ Probably would not try it
- ○ Might or might not try it
- ○ Probably would try it
- ○ Definitely would try it

How likely are you to buy this product?

- ○ Definitely would not buy it
- ○ Probably would not buy it
- ○ Might or might not buy it
- ○ Probably would buy it
- ○ Definitely would buy it

This question just helps us know whether we are using quality data. It will not affect your participation in this study.

What were you doing 200 years ago?

- ○ I was not born.
- ○ I was working in a shipyard.
- ○ I was travelling the world.
- ○ I was watching a movie.

The last set of questions asks about your diet and demographic information.

Which category best describes your diet?

- ○ Omnivore (I eat meat, such as beef, pork, chicken, turkey, fish and/or shellfish

- ○ Flexitarian (I sometimes eat meat, but I often chose plant-based foods instead)
- ○ Pescatarian (I eat fish and/or shellfish, but no other types of meat)
- ○ Vegetarian (I don't eat meat of any kind, but I do eat eggs and/or dairy products)
- ○ Vegan (I don't eat meat, eggs, dairy products, or other animal-derived ingredients)

Which statement best describes your meat consumption?

- ○ I never eat meat.
- ○ I rarely eat meat.
- ○ I sometimes eat meat.
- ○ I often eat meat.
- ○ I almost always eat meat.

Compared to one year ago, how much meat are you eating now?

- ○ A lot less
- ○ Slightly less
- ○ No change
- ○ Slightly more
- ○ A lot more

Which statement best describes how frequently you consume meat substitutes? (for example, veggie burgers, plant-based sausages/hot dogs, tofu, seitan)

- ○ Rarely/never
- ○ Once every few months
- ○ Once a month
- ○ Once a week
- ○ Multiple times per week
- ○ Daily

Which categories of race/ethnicity describe you? (Select ALL that apply)

- ○ Hispanic, Latino, or Spanish

- ○ White or Caucasian
- ○ Black or African American
- ○ American Indian or Alaska Native
- ○ South Asian (Indian Subcontinent)
- ○ Asian
- ○ Middle Eastern or North African
- ○ Native Hawaiian or other Pacific Islander
- ○ Other (specify): _____
- ○ Prefer not to answer

In which state do you currently reside?

▼ Alabama … I do not reside in the United States

How would you describe your political views?

- ○ Very conservative
- ○ Conservative
- ○ Moderate
- ○ Liberal
- ○ Very liberal

Appendix E. Phase 3 Survey

Greetings,

My name is Keri Szejda, and I am a Visiting Scholar in the School of Social and Behavioral Sciences at Arizona State University. I am conducting a research study about perceptions of a new food innovation. Your participation in this study may help inform the development of a new consumer product. There are no foreseeable risks or discomforts to your participation. Participation in this study involves answering survey questions. The survey will take about 5 minutes to complete. We will not ask your name or any other identifying information in this survey. For research purposes, an anonymous numeric code will be assigned to your responses. However, your Amazon MTurk worker ID number will be temporarily stored in order to pay you for your time; this data will be deleted as soon as it is reasonably possible. You have the option of making your personal information private by changing your MTurk settings through Amazon.

The results of this study may be used in reports, presentations, or publications. Your participation in this study is voluntary. You can skip questions if you wish. If you choose not to participate or to withdraw from the study at any time, there will be no penalty. You must be 18 or older to participate in the study. Compensation for participating in this study is $0.75. If you have any questions concerning the research study, please email me (keri.szejda@asu.edu) or Dr. Jeffrey Kassing (jkassing@asu.edu). If you have any questions about your rights as a subject/participant in this research, or if you feel you have been placed at risk, you can contact the Chair of the Human Subjects Institutional Review Board, through the ASU Office of Research Integrity and Assurance, at (480) 965-6788.

Sincerely,

Keri Szejda, PhD

If you wish to be part of the study, click "next".

To begin the survey, please carefully read the product description below.

This new [pipe text] burger is made entirely from plants and has no animal ingredients. It looks, tastes, and cooks just like conventional meat. It is produced using plant ingredients like proteins, fats, and carbohydrates to mimic the structure of conventional meat. These new [pipe text] burgers have recently become widely available at grocery stores and restaurants.

○ I have read the description of the [pipe text] burger and am ready to continue the survey.

Overall, I expect that this product would be *very appealing*.

○ Strongly disagree

○ Somewhat disagree

○ Neither agree nor disagree

- ○ Somewhat agree
- ○ Strongly agree

I expect that this product would *taste very good.*

- ○ Strongly disagree
- ○ Somewhat disagree
- ○ Neither agree nor disagree
- ○ Somewhat agree
- ○ Strongly agree

I expect that this product would have an appealing *texture.*

- ○ Strongly disagree
- ○ Somewhat disagree
- ○ Neither agree nor disagree
- ○ Somewhat agree
- ○ Strongly agree

I expect that this product would have an appealing *smell.*

- ○ Strongly disagree
- ○ Somewhat disagree
- ○ Neither agree nor disagree
- ○ Somewhat agree
- ○ Strongly agree

I expect that this product would be very satiating/filling.

- ○ Strongly disagree
- ○ Somewhat disagree
- ○ Neither agree nor disagree
- ○ Somewhat agree
- ○ Strongly agree

This product is compatible with the image I have of myself.

- ○ Strongly disagree
- ○ Somewhat disagree
- ○ Neither agree nor disagree
- ○ Somewhat agree
- ○ Strongly agree

This product reflects who I am.

- ○ Strongly disagree
- ○ Somewhat disagree
- ○ Neither agree nor disagree
- ○ Somewhat agree
- ○ Strongly agree

This product is for me.

- ○ Strongly disagree
- ○ Somewhat disagree
- ○ Neither agree nor disagree
- ○ Somewhat agree
- ○ Strongly agree

I would try this product if somebody gave it to me.

- ○ Strongly disagree
- ○ Somewhat disagree
- ○ Neither agree nor disagree
- ○ Somewhat agree
- ○ Strongly agree

I would be very interested in trying this product.

- ○ Strongly disagree
- ○ Somewhat disagree
- ○ Neither agree nor disagree
- ○ Somewhat agree
- ○ Strongly agree

How likely are you to *try* this product?

- ○ Definitely would not try it
- ○ Probably would not try it
- ○ Might or might not try it
- ○ Probably would try it
- ○ Definitely would try it

How likely are you to buy this product?

- ○ Definitely would not buy it
- ○ Probably would not buy it
- ○ Might or might not buy it
- ○ Probably would buy it
- ○ Definitely would buy it

This question just helps us know whether we are using quality data. It will not affect your participation in this study.

What were you doing 200 years ago?

- ○ I was not born.
- ○ I was working in a shipyard.
- ○ I was travelling the world.
- ○ I was watching a movie.

The last set of questions asks about your diet and demographic information.

Which category best describes your diet?

- ○ Omnivore (I eat meat, such as beef, pork, chicken, turkey, fish and/or shellfish
- ○ Flexitarian (I sometimes eat meat, but I often chose plant-based foods instead)
- ○ Pescatarian (I eat fish and/or shellfish, but no other types of meat)
- ○ Vegetarian (I don't eat meat of any kind, but I do eat eggs and/or dairy products)
- ○ Vegan (I don't eat meat, eggs, dairy products, or other animal-derived ingredients)

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- ○ I never eat meat.
- ○ I rarely eat meat.
- ○ I sometimes eat meat.
- ○ I often eat meat.
- ○ I almost always eat meat.

Compared to one year ago, how much meat are you eating now?

- ○ A lot less
- ○ Slightly less
- ○ No change
- ○ Slightly more
- ○ A lot more

Which statement best describes how frequently you consume meat substitutes? (for example, veggie burgers, plant-based sausages/hot dogs, tofu, seitan)

- ○ Rarely/never
- ○ Once every few months
- ○ Once a month
- ○ Once a week
- ○ Multiple times per week

- ○ Daily

Which categories of race/ethnicity describe you? (Select ALL that apply)

- ○ Hispanic, Latino, or Spanish
- ○ White or Caucasian
- ○ Black or African American
- ○ American Indian or Alaska Native
- ○ South Asian (Indian Subcontinent)
- ○ Asian
- ○ Middle Eastern or North African
- ○ Native Hawaiian or other Pacific Islander
- ○ Other (specify): _____
- ○ Prefer not to answer

In which state do you currently reside?

▼ Alabama … I do not reside in the United States

How would you describe your political views?

- ○ Very conservative
- ○ Conservative
- ○ Moderate
- ○ Liberal
- ○ Very liberal

Appendix F – Demographics by Purchase Intent

Demographic Characteristic	High Purchase Intent %	Overall Sample %	High Purchase Intent n	Overall Sample n
Age				
Millennial	42.0	38.4	214	448
Gen X	27.5	29.4	140	343
Boomer	30.5	32.2	155	376
Gender				
Male	45.8	48.8	233	570
Female	54.2	51.2	276	597
Non-binary/Other	0.0	0.0	0	0
Race/Ethnicity				
Hispanic, Latino, or Spanish	9.0	7.0	46	82
White or Caucasian	78.4	82.0	399	957
Black or African American	10.4	8.2	51	96
American Indian or Alaska Native	1.4	1.3	7	15
Asian	10.1	6.4	37	75
Middle Eastern or North African	0.4	0.3	2	3
Native Hawaiian or Other Pacific Islander	0.6	0.3	3	3
Other	0.8	0.6	4	7
Region				
West	22.6	21.9	115	256
Midwest	19.6	21.2	100	247

South	37.5	37.4	191	437
Northeast	20.2	19.5	103	227
Household Income				
Less than $9,999	2.8	3.0	14	35
$10,000 to $24,999	14.3	15.3	73	178
$25,000 to $39,999	18.5	17.7	94	207
$40,000 to $59,999	24.8	22.2	126	259
$60,000 to $84,999	19.3	20.2	98	236
$85,000 to $114,999	12.0	12.3	61	144
$115,000 to $149,999	3.9	5.0	20	58
$150,000 to $199,999	2.2	2.6	11	30
$200,000 or more	2.4	1.7	12	20
Political Views				
Preferred not to answer	0.0	0.2	0	2
Very conservative	3.1	5.5	16	64
Conservative	17.1	21.5	87	251
Moderate	25.1	25.9	128	302
Liberal	35.6	32.0	181	374
Very Liberal	19.1	14.9	97	174
Education				
Eight grade education or below	0.0	0.3	0	3
High school or GED	20.0	21.9	102	256
Trade/technical/vocational	10.4	10.4	53	121
Associate's degree	19.1	15.9	97	186
Bachelor's degree	37.7	38.3	192	447
Master's degree	10.0	10.3	51	120

Professional degree – JD, MD	1.2	1.7	6	20
Doctorate degree	1.6	1.2	8	14
Current plant-based meat/product consumption				
Rarely or never	22.8	47.5	116	554
Once every few months	20.6	18.3	105	214
Once per month	16.7	11.7	85	137
Once per week	20.0	11.1	102	129
Multiple times per week	15.9	8.8	81	103
Daily	3.9	2.6	20	30
Current meat consumption				
Never	10.0	5.5	51	64
Rarely	10.6	6.1	54	71
Sometimes	31.6	25.9	161	302
Often	36.9	42.6	188	497
Almost always	10.8	20.0	55	233
Diet				
Omnivore	57.4	74.6	292	871
Flexitarian	27.9	1.8	142	21
Pescatarian	3.1	17.5	16	204
Vegetarian	7.7	4	39	47
Vegan	3.9	2.1	20	24
Meat reduction over past year				
A lot less	13.2	7.4	67	86
Slightly less	29.3	22.7	149	265
No change	51.9	63.8	264	744
Slightly more	4.3	4.9	22	47

A lot more	1.4	1.3	7	15

About GFI

The Good Food Institute is a global nonprofit building a sustainable, healthy, and just food system. With expertise across the scientific, regulatory, industry, and investment landscape, we are accelerating the transition of the world's food system to alternative proteins, using the power of food innovation and markets.