Non-formal Nutrition Education in Grocery Stores: Analyzing changes in spinach consumption patterns following exposure to health-related signage

Abstract

Nutrition education in the United States must be revamped and strengthened. Strategies must be reformed to focus on easing consumer confusion. This research project created and surveyed the effectiveness of a small, in-aisle produce sign for spinach that highlighted a specific health outcome (lowered risk for heart disease). Of 53 respondents, 34% reported a plan to increase spinach consumption after viewing the test sign. This high rate of response indicates that further research and study on this intervention is warranted. However, it is also noted that this cannot be the sole solution for solving nutrition education problems. Many solutions working together must take on that feat.

Key Search Terms

spinach; non-formal education; education; nutrition; grocery stores; environmental education; consumer behavior; behavior change; health outcome; sign design

Introduction and Literature Review

Nutrition awareness in the United States is struggling. Most Americans are unable, or unwilling, to link what they eat with their personal health, despite a monumental amount of scientific health research and knowledge. Laden with statistics about cholesterol rates and nutrient uptakes, consumers find it exceedingly difficult to transform an onslaught of nutrition information into a coherent, tasty, and affordable shopping list. Advice comes from countless angles — coaches, nutritionists, websites, commercials, doctors, magazines, parents, teachers. An International Food Information Council Food and Health survey found that 8 in 10 respondents thought that “there’s a lot of conflicting advice about what foods they should eat or not eat, and many find that this conflicting information makes them doubt their food choices” (Dennett 2017).

Eighty percent. A stunningly high number of confused consumers. And it doesn’t stop there. This confusion breeds more confusion. “Many respondents said they turn to their friends and family for guidance on food choices, even though they see dietitians and health care professionals as the most trusted sources for guidance” (Howard 2017). Confused people asking other confused people. Down the rabbit hole we go.

This point is illuminated further in a study conducted by Lara Spiteri Cornish and Caroline Moraes. In their report, they state,
“Interpretive findings suggest that consumer confusion regarding nutrition information is indeed affecting nutrition knowledge, and literacy, which in turn is impacting consumer perceptions of healthy foods and consequent dietary behaviors... it is not that consumers are not responding to healthy eating communications, but rather that they are responding based on their flawed nutrition knowledge and literacy” (Spiteri Cornish and Moraes 2015, 570).

Consumers want to eat healthily but lack key elements to make that happen.

Nutrition confusion is especially puzzling when discussing what we should eliminate or reduce in our diets (versus what to add). The 2016 federal dietary guidelines update talks about well-known foods to add to your diet but then switches mainly to “nutrients” when discussing reductions (HHS 2015). “In place of foods we know—things we understand well and can eat more of or try to avoid—are nutrients we’ve heard but likely misunderstand. Instead of sugary drinks, we’re told to limit sugar; instead of red meat, we’re told to limit saturated fat; instead of processed foods, we’re told to limit sodium” (Ferdman 2016). New York University professor Marion Nestle states, “The minute they start to talk about things to eat less of, they invoke nutrients instead of foods...I dare someone to explain saturated fat to me, or to tell me where most sugar or salt comes from in their diet” (Ferdman 2016).

Why might the guidelines make a switch like this, from talking foods to rattling off nutrients? One answer is money. The meat and sugar (corn) industries are huge. They represent billions of dollars, which translates into extreme political and legal power. These industries use such power to pressure government agencies to water down any recommendations that may hurt their bottom line. So meat limitations become disguised as “saturated fat”, and soda drinks are replaced with “sugar intake”.

It’s also possible that the USDA doesn’t want to step on anyone’s toes or be seen to target any one specific product. The latter could result in a lawsuit or other court struggle. So instead of standing their ground to promote effective nutrition strategies, the USDA pushes the burden onto already-confused consumers. They rely heavily on Nutrition Fact Panels (NFPs). NFPs are supposed to be a consumer’s friend, laying out a product’s ingredients and specific nutritional content. But the ineffectiveness of this strategy is becoming more and more clear. For instance, a 2014 survey by the Food and Drug Administration (FDA) found that, “While nine in ten adults had heard of trans fat or omega 3 fatty acids (B1), a quarter of those aware of either of the fats could not tell if the fat raises, lowers, or has no relationship with the risk of heart disease (B2)” (FDA 2014, 3). What’s more is that trying to clarify these labels can do more harm than good. “NFP changes that are intended to clarify product nutrition facts may have the unintended consequence of causing misinterpretations of the label information” (Laquatra, et. al 2015, 1758-63).

Deciphering nutrition label and nutrient recommendations takes much time and energy, two things the average American doesn’t have in excess. Consumers understandably become overwhelmed and end up minimizing the problem, not paying attention, or putting off solving the problem. It’s not a surprise that obesity and heart disease are on the rise. The strategy surrounding nutrition education must be transformed. Nutrition needs to take pressure off of consumers and talk in real, recognizable foods.
Spiteri Cornish and Moraes provide three equally-necessary steps for creating a viable solution. Their report states, “Consumers need:

1. Appropriate nutrition literacy including correct information (i.e., legitimate knowledge derived from health communicators’ information),
2. The capacity to interpret such information (i.e., nutrition self-efficacy), and
3. The opportunity as well as motivation to apply correct nutrition knowledge in several contexts and situations (Block et al., 2011)” (Spiteri Cornish and Moraes 2015, 570-1 and Block et al., 2011).

Grocery stores provide an excellent venue for using such steps to re-strategize nutrition education. First of all, they already have a large audience in place: the majority of Americans shop at a grocery store (as opposed to a deli or corner store). This is a huge plus when trying to effect change on a large scale. Trying to put together an equivalent audience would require extensive time and energy. Secondly, This strategy requires no extra effort for finding information on the part of consumers. Grocery store trips already fit into their patterns of daily life. Thirdly, people typically go to a grocery store at least a couple times per month. This means consumers are likely to experience any intervention on an ongoing basis. Repetitive exposure is key to forming new healthy behaviors. Fourthly, learning in-store is convenient for consumers. They don’t have to learn information in one place (schools, television, online, etc.) and remember it until they can use it when buying in another location. The weight of having to immediately recall new nutrition information is eased.

However, some education strategies within grocery stores have proven to be more effective than others. Take the following example:

A 2016 study by Schultz and Litchfield compared the effectiveness of traditional in-person aisle demonstrations (AD) versus technology-based (TB) strategies (social media, large in-store posters, a 2-3 minute video, intercom messaging, etc) in relaying nutrition-based information. The study found in favor of aisle-based demonstrations for changing consumer behavior, likely due to the active and personalized nature of the demonstrations. The report states, “Both nutrition education treatments elicited similar shopper awareness; however, greater AD engagement suggests consumer preference. Despite relevant content, TB lessons may not provide equivalent engagement opportunity/experience” (Schultz and Litchfield 2016, 355).

Despite this evidence, aisle-based demonstrations present significant barriers as a nutrition education solution when trying to employ them across a variety of grocery stores. The demonstrations take up a significant amount of time, energy, money, and space to plan and carry out. Many stores simply cannot afford to expend such resources, especially on an on-going basis (necessary to ensure a benefit for a maximum number of customers). Therefore, further research is needed to find a complementary solution that appeals both to consumers on a personal level and to the reality of limited store resources.

Any solution would need to include some kind of tailoring to grip customers on a personal level. To learn from the successes of personalization in aisle demonstrations. Tailoring messages is known to dramatically increase intervention success (Rothman
2006). But how might we effectively tailor a message that is intended for multitudes of people across the country?

This study suggests testing the effectiveness of small in-store signs that outline the direct connection between whole foods and their health-related outcomes. Each sign would be displayed alongside the corresponding product in the store (versus in the entry, ends of aisles) to maximize consumer connection potential. Contrary to traditional NFPs, the focus would be on easily recognizable health-related outcomes (high blood sugar, heart disease, etc.) instead of solely mysterious “nutrients”. This would cut out an important barrier to consumer understanding and potentially increase connection potential.

With this in theory in mind, this study strives to answer the following question:

*Does the display of health-related signs (nutrient content, body-specific benefits) for items in the fresh produce section of a grocery store influence consumer purchasing habits?*

**Methodology**

**Test sign subject choice**

Spinach was chosen as a sign test subject for several reasons. First of all, it is available in most grocery stores across the United States. Survey respondents are highly likely to have encountered it previously (whether or not they chose to purchase). This is important because the survey will gauge how much more likely respondents will purchase spinach based on observation of the aforementioned small sign. (A separate study would be needed for trying to get consumers to purchase entirely new foods.) Additionally, spinach is known to lower blood pressure and lessen the risk of heart disease (Harvard 2017; USDA 2016; Tufts 2015). This speaks to Schultz & Litchfield’s and Rothman’s emphasis on the need to personalize information to create behavior changes. Heart disease and heart disease-related deaths are the No. 1 cause of death in the United States, and 1 in every 3 of those deaths are preventable (AMA 2014). This is an intensely personal issue for many people. Foods that lower risk may therefore be of great interest to many consumers. For instance, a consumer may take a second look at spinach if they have a husband or wife at high risk of heart disease and read that it can lower such risk. Connecting foods directly to health outcomes like heart disease relates to consumers on a deeper level, increasing the likelihood of healthy behavior changes.

Drawbacks to using spinach as a test subject must also be considered. For instance, some people may simply not like the taste no matter how it is prepared or incentivized. However, this may be the case for any chosen test subject, making spinach just as viable as any alternative. Also, certain consumers may have an allergy. Again, this may be the case with any chosen subject.

Given this information, the focus question mentioned above can be honed even further:

*In the produce section of the grocery store, does an informational sign (simple, pleasing to the eye) displaying the heart health benefits of spinach increase its purchase by consumers?*
Sign design and content

Next up was devising a sign to test for the study. Coincidentally, a few weeks into this study, the author came upon nutrition signs in the aisles of a Trader Joe’s store in Brooklyn, NY (See Image 1). This experience backed up the idea that nutrition education was a realistic option in a grocery store setting. However, the Trader Joe’s Sign still relied heavily on specific nutrient content (fiber and vitamin C for Gala apples). There was little mention of relatable health outcomes in any of the signs (one briefly mentioned blood sugar). Even so, the look of the Trader Joe’s signs was attractive, and served as a jumping off point for this study’s design.

There are multiple guidelines to be aware of when designing a sign to attract consumer attention. Visual appeal is the first consideration. A 2016 Adobe Spark article outlines eight basic principles to creating exceptional graphics: alignment, hierarchy, contrast, repetition, proximity, balance color, and space (Copperman 2016). Color and contrast were of particular importance to this design because the signs needs to stand out in an already packed location (the produce aisle). Yellow was chosen as a background color because it “creates a sensation of happiness” and contrasts well with the dark green spinach it will be placed beside (See Images). It was also used in many of the Trader Joe’s signs. (Yellow and green are known as analogous colors, along with yellow-green). A softer, lighter yellow was used to contrast with the black text and not to strain readers’ eyes.

Image 1: Produce sign from Trader Joe’s (City Point location in Brooklyn, NY; 10/17)
Content for the sign came in two forms: illustration and text. An artistic illustration of spinach leaves was included in the sign for quick product recognition and to provide pleasing visual contrast with text (See image 3). (Note that this is another difference to the Trader Joe’s signs. Those signs all have the same generic bunch of produce.) Using illustrations with text provides two avenues to grab customer attention while they are busy shopping, as some people naturally gravitate toward textual information, others images. The image is intentionally simple so as not to be confusing or overstimulating. Text for the sign had to adequately explain the connection between spinach and heart disease, be in an easily readable format, and succinct enough for busy shoppers. The author chose to highlight key findings using quick-read bullet points using a minimum of words. She also made sure recognizable health outcomes were first in case customers only read one bullet point. Text font and size were formatted for ease of reading from a relatively close distance (1’-4’). A rule of about 1” text height per 10’ of reading distance was engaged (Fell 2014). (It must also be noted that for areas of high lingual diversity, signs should have appropriate translations.)

The overall size of the sign had be small enough so as not to block the produce and also allow employees to easily work around it, but large enough to stand out to consumers. In the case of Trader Joe’s, signs are placed below produce along the shelf’s edge (See Image 2 above). This represents an ideal situation. Signs could also be attached to shelves with clips or small clamps.
Once these decisions had been made, where and how to arrange each element on the sign needed to be addressed. A 2015 article by Mary Stribley lays out ten key rules of composition and served as a reference for the design. They are:

1. Find Your Focus  
2. Direct the Eye With Leading Lines  
3. Scale and Hierarchy  
4. Balance Out Your Elements  
5. Use Elements That Complement One Another  
6. Boost (or Reduce) Your Contrast  
7. Repeat Elements of Your Design  
8. Don’t Forget the White Space  
9. Align Your Elements  
10. Divide Your Design Into Thirds

The rules regarding placement (#1), scale and hierarchy (#3), balance (#4), contrast (#6), and alignment (#9) were particularly relevant for this project (Stribley 2015).

Survey Design and Distribution

To gauge potential effectiveness of such a sign, a 28-question online survey was designed to measure current consumer purchasing knowledge and habits, and potential changes after sign exposure (See Image 1 above). It also asked questions regarding the visual appeal of the sign. The survey platform Qualtrics was employed because use is free for NYU students. It is also exceedingly user-friendly.

Overall survey design was modeled in the pre- and post- strategy (before and after exposure to seeing the sign) with both quantitative and qualitative questions. One pair of questions was nearly identical in order to make a direct comparison in consumer purchasing before and after sign exposure. (“How often do you eat a serving of spinach?” and “How often do you plan to eat a serving of spinach?”) Another pair was identical to gauge information retention. (“Spinach is known to have the greatest positive influence on which of the following health outcomes?”)

Pre-sign exposure questions also included a few that looked at how health-conscious respondents were already. The purpose was to see 1) if those with healthier reporting currently ate more or less spinach than those of less healthy reporting and 2) if those with healthier or less healthy reporting were more or less likely to change based on sign exposure. This section was included to see which areas were more likely to need a second or third intervention other than the in-store nutrition sign.

Post-sign exposure questions included a few regarding the visual appeal of the sign itself. These questions were included to see 1) if respondents may actually read the sign in a grocery store, 2) what about the sign stood out, and 3) how design could be improved.

One question regarding whether or not the respondent suffered from health-related problems or knew someone who suffered from heart-related problems was included to measure whether or not the sign may be more or less appealing because of spinach’s connection to reduced risk of heart disease.
Several common demographic questions were included at the end of the survey, such as regarding income, age, education level, and ethnicity. They were included to see if there may be any surprising connections.

(See Appendix I to view the final survey and its sections).

The online survey was distributed three ways: via personal email contacts, the general NYU Environmental Conservation Education listserv, and a LinkedIn posting. For the email, the author sent it to 36 of her personal contacts. For the listserv, she sent it to all 158+ members, asking those in her class not to participate. (These people had already heard about her project in-depth, and their response would skew the data.) For the posting, the author put a link to the survey on her personal LinkedIn account (appx. 506 connections). In all three cases, she sent out a reminder to recipients about one week after initial contact. The survey was open from November 7-17, 2017.

Drawbacks to this method of distribution include the “like attracting like” principle (personal bias). In essence, mainly sending the survey to people the author knows may not make for enough diversity of respondents when trying to test something that could potentially cross many income, race, education lines, etc. The author did encourage first contact respondents to forward the survey to others to minimize this bias.

It must be noted that this survey does not pretend to be the only iteration for this idea. It is a starting point. Recruitment of a more diverse respondent pool reflective of the grocery store clientele across the U.S. would be a next step after completion of analysis for this survey.

**Survey Results**

A total of 53 responses were gathered from the survey.
Pre-assessment of Respondents' Spinach Eating Habits

![Graph 1]

**Consumption Patterns**

Before exposure to the test sign, 1 person reported never eating spinach in a year, 7 said “a few times per year”, 11 reported “1 time per month”, 21 said “2-3 times per month”, and 13 said “1 or more times per week”.

Post-assessment of Respondents' Eating Habits

![Graph 2]

After exposure to the test sign, 1 person reported that they never planned to each spinach, 3 said “a few times per year”, 7 said “1 time per month”, 21 said “2-3 times per month”, and 21 said “1 or more times per week”.

Qualitative answers included:
• “It’s yummy and now I know more about the details of the positive impacts”
• “I don’t like spinach that much. There are other foods that can give similar nutritional benefit to me that I prefer.”
• “I like spinach, but I usually only eat it when it’s made available”
• “my husband doesn’t like the taste”
• “Don’t always make it to the farmer’s market or fairway for produce I trust”
• “Family history of heart disease”
• “I have become more aware of its benefits”

Each respondents’ pre- and post-sign exposure responses were compared individually. It was found that 18 respondents (34%) showed a plan to increase their spinach consumption post-sign exposure. 34 people (64%) reported no planned change, and 1 person (2%) said they planned on eating less spinach. Of those that said they planned on eating more spinach, 4 (22%) went from “a few times per year” to “1 time per month”, 6 (33%) went from “1 time per month” to “2-3 times per month”, 5 (28%) went from “2-3 times per month” to “1 or more times per week”, and 3 (17%) jumped from “1 time per month” to “1 or more times per week”.

The entirety of pre and post-consumption patterns were also compared. Answers were given numerical value (“never” = 0; “a few times per year” = 1; “1 time per month” = 2; “2-3 times per month” = 3; “1 or more times per week” = 4). The average for the 53 respondents before sign exposure was 2.735849057 and 3.094339623 after exposure. This reveals a planned increase in spinach consumption of 0.35849057. A t-test for this increase calculation revealed a value of 0.06630658164, or 6.6%. As the standard of significance is 5% or less, these results do not show statistical significance.

It should be noted that 12 of the 34 respondents (35%) who reported no increase in spinach consumption post-sign exposure already reported eating the maximum amount of spinach in the answer choices in the pre-survey. Therefore, they may plan on eating

![Graph 5]

more spinach in the future or stay at the same amount. A follow-up question would be necessary to gauge this information.
Relatability to sign content

As this was an online survey of an intervention that would actually take place in stores, a question regarding whether or not respondents would read the sign in a real-world situation was included. 31 people (58%) said “yes”, 6 (11%) said “no”, and 16 (30%) said “maybe/unsure”.

Opinion: Do you or someone you know suffer from heart disease or a heart-disease related illness?

Graph 4

Opinion: Respondents’ Relatability to Sign Information

Graph 3
Information Retention

Before exposure to the test sign, 42 of the 53 respondents (81%) correctly chose the health outcome most affected by spinach consumption (heart disease) in a list of five potential answers. After exposure, 52 of the 53 respondents (98%) chose correctly.

Sign Design
Questions regarding sign design were included in order to see if/how it could be changed to be more effective. Here are the results:

Qualitative answers included:

- “I would wonder if it was an ad from a company or PSA.”
- “It has a little too much text. If I’m in a hurry I might not read it. If it had more illustrations and less text, I might be more willing to take the time to read it.”
- “Its eyecatching and provides concise, brief information”
- “It’s easily accessible (i.e. where I already am) and informative”
- “Yellows and greens are everywhere in the produce section of the grocery store. It would be hard to distinguish from everything else.”
- “There’s a lot of information for my senses to take in while shopping already so I’m often focused in on my shopping list and try to resist the urge to be inundated by more advertising.”
- “I’d probably glance at it, but I don’t know how in depth I’d read it”
- “I already know spinach is healthy so it would be a waste of my time to read the sign.”

Health Awareness and Activity
Before purchasing a new item, how often do you read the Nutrition Fact Panel on the label?

Graph 15

There were 5 questions regarding respondents’ healthy habits. They were included to see whether those with more or less healthy habits were more or less likely to change consumption behavior based on exposure to the sign.

Graph 11

Do you currently have health insurance?

Yes

No

Graph 13

Have you heard anything about heart disease or heart attacks being related to things people eat or drink?

Yes

No

Graph 14

May/June
Most respondents identified as white and between the ages of 25-34. Education was more evenly spread, although almost all respondents had at least a bachelor’s degree. Income held the the most varied responses, respondents making anywhere from less than $25,000 per year to $200,000 or more.

Discussion

Results of the survey revealed that 34% of consumers would increase their spinach consumption after viewing the test sign. That is about 1 in every 3 people exposed to the intervention. That is quite significant. It is enough to make nutrition educators and grocery store owners seriously consider such signs as a viable intervention and dedicate time to study it more deeply.
48 of 53 of respondents said the sign related to their life “a little bit” or “a lot”. Connecting a specific health outcome (heart disease) with nutrition information (vs. just nutrients) likely had a significant effect on this result. 47% of respondents reported having heart disease or a related illness or knowing someone who did. Moreover, recognition of the greatest health outcome benefit of spinach (lowering risk of heart disease) jumped from 81% to 98% pre and post-sign exposure, respectively. Respondents were clearly able to make the connection from reading the test sign. What’s more is that even though the survey was given online, over 58% of respondents reported that they would read the sign in an actual store, with another 30% saying “maybe/unsure”. Clearly, the information in the sign was of value and easy to relate to and understand. Moreover, 37 people rated the sign as “somewhat attractive” or “very attractive”. This is important because well-designed displays are crucial to gaining attention in the hopes of relaying new information.

There were several areas the survey and design could be improved. First of all, there is the issue of personal bias in recruiting respondents. The survey was distributed using three avenues directly connected to the author’s personal life. This is likely why the majority of respondents were white and between 25-34 years old. (The author is a 29-year-old white woman.) Although, there was a good amount of variation in income levels and some difference in education experiences. Nevertheless, the survey should be expanded to include a wider variety of citizens, especially since a goal of the study is to create small produce signs applicable to many locations and groups of people.

Secondly, several of the survey questions rely on self-reporting by respondents. The reported answers may or may not accurately reflect actual actions and events. This also goes to the reality that the survey was given online while the intervention would be in the tangible world. A next step for this study would be to place signs in real stores while monitoring consumption patterns. There could also be in-person customer interviews and longer-term behavior tracking. A follow-up survey could also be conducted to see how long the health information is retained.

Third, although specific health questions were included to gauge whether or not respondents were more or less healthy lifestyles were more or less likely to change given the intervention, it is unclear how these results should be interpreted. It is also unclear if the questions created were sufficient to make such an assessment. The author would need to consult an expert in the field before attempting such an interpretation. It is somewhat a matter of “putting the horse before the cart” to include these questions in this survey at this time.

Lastly, design of the sign would need to be readdressed. Many respondents found the yellow too jarring and fonts less reader-friendly. Several people made comments about not having bullet points. Some liked the spinach leaf design, some didn’t. Many wanted larger/more illustrations. Signs could also be changed to include QR codes to connect to more information. Overall, responses were very useful in seeing what consumers preferred and found helpful.

It should also be noted that contact was made through email to both the Flatbush Food Co-op and Trader Joe’s in Brooklyn, NY to gather information regarding the nutrition education strategies in their stores. However, interviews were unable to be set up before the end of this study.
Conclusion

It is important that nutrition education signs convey relatable health information to empower consumers to have true autonomy over their health choices. To not just sell spinach with slick advertising, but to give consumers a reasonable understanding of why and how spinach (or another food) affects their health. To have consumers focus on the benefits or drawbacks of a food as a whole instead of just one nutrient or ingredient. Informational signs need to increase consumer knowledge of reliable nutrition information and reduce confusion. This study has shown that there is both an important interest and value (behavioral, monetary) in exploring small in-aisle signs that link products directly with health outcomes. Having such signs in grocery stores gives consumers an easily accessible place to learn this crucial information.

It must also be said that there is no single “magic bullet” that will solve our nutrition education woes. Only installing signs like these won’t make the population incredibly nutrition-conscious. However, signs such as these are a piece of the puzzle. They are one of many smaller solutions that can work together to build a healthier world.

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References


Appendix I: The survey
I am a graduate student at New York University and am conducting a short survey. If you don’t feel like continuing the survey, you can stop anytime. If you have any questions after the survey, you can contact me by email Sreja Tostison (st2133@nyu.edu) or Prof. Raul Lejano (lejano@nyu.edu).

Think about your eating habits. In general, how healthy is your overall diet?

- Poor
- Fair
- Good
- Very Good
- Excellent

How often do you eat a serving of fruits and vegetables? (one serving is about 1 cup of raw vegetables OR 2 cups of leafy vegetables OR 1 cup of fruit OR 1 cup of fruit juice)

- Less than once per month or Never
- 1-3 times per month
- 1-2 times per week
- 3-6 times per week
- 1-2 times per day
- 3 or more times per day

How often do you eat a serving of spinach? (one serving is about 2 cups uncooked)

- Never
- A few times per year
- 1 time per month
- 2-3 times per month
- 1 or more times per week

Pre-sign Exposure Questions

Spinach is known to have the greatest positive influence on which of the following health outcomes...

- heart disease
- arthritis
- stroke
- high blood sugar
- depression

Before purchasing a new item, how often do you read the Nutrition Fact Panel on the label (which contains nutrient information, ingredients, etc.)?
Take a moment to look at the following image:

**SPINACH**
- Can lower your risk for heart disease
- Rich in Vitamin K, known to reduce blood pressure
- Loaded with iron, B-vitamins and magnesium

Add a handful to a salad or sandwich for an easy boost!

Sign Exposure
Post-sign Exposure Questions

Imagine you're on a regular shopping trip at the grocery store, making your way through the produce section. You see the sign from the previous question near the spinach. Would you stop and read it?

- Yes
- No
- Maybe/Unsure

Why or why not?

How would you rate the sign's overall appearance?

- very unattractive
- somewhat unattractive
- neither unattractive nor attractive
- somewhat attractive
- very attractive

Please explain what you found unattractive or attractive about the sign.

The amount of information in the sign is...

- Too much
- Just right
- Too little

How often do you plan to eat a serving of spinach? (one serving is about 2 cups uncooked)

- Never
- A few times per year
- 1 time per month
- 2-3 times per month
- 1 or more times per week

Why or why not?

The information in the sign applies to my life...

- not at all
- not much
- a little bit
- a lot

Think about the information in the sign you just saw. Was the information...

- already known to you
- somewhat known to you
- somewhat unknown to you
- completely unknown to you

Spinach is known to have the greatest positive influence on which of the following health outcomes...

- heart disease
- arthritis
- stroke
- high blood sugar
- depression
### Demographic Questions

**Do you currently have health insurance?**
- Yes
- No
- Maybe/Unsure

**Do you or someone you know suffer from heart-related health problems?**
- Yes
- No
- Maybe/unsure

**What is your age?**
- Under 18
- 18-24
- 25-34
- 35-44
- 45-54
- 55-64
- 65 and older

**What is your ethnicity?**
- White
- Black or African American
- American Indian or Alaska Native
- Asian
- Native Hawaiian or Pacific Islander
- Hispanic or Latino
- Other

**What was your total household income before taxes during the past 12 months?**
- Less than $25,000
- $25,000 to $34,999
- $35,000 to $49,999
- $50,000 to $74,999
- $75,000 to $99,999
- $100,000 to $149,999
- $150,000 to $199,999
- $200,000 or more

**What is the highest degree or level of education you have completed?**
- Some high school, no diploma
- High school graduate (includes equivalency)
- Some college, no degree
- Associate's Degree
- Bachelor's Degree
- Some postgraduate, no degree
- Graduate or Professional Degree
- Ph.D.
- Other

**If you are pursuing or have achieved an undergraduate degree (Bachelor or Associate's), what is/was your degree and major area of study?**

**If you are pursuing or have achieved a post-graduate (M.A., M.S., Ph.D., etc.) what is your degree and major area of study?**

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We thank you for your time spent taking this survey. Your response has been recorded.