

CLIMATE CHANGE AND THE AMERICAN DIET



YALE PROGRAM ON
Climate Change
Communication



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Introduction

This report is based on findings from a nationally representative survey conducted by the Yale Program on Climate Change Communication (climatecommunication.yale.edu) and Earth Day Network (earthday.org). Interview dates: December 6 – 11, 2019. Interviews: 1,043 Adults (18+) in the U.S. Average margin of error +/- 3 percentage points at the 95% confidence level. The research was funded by Earth Day Network as part of its [Foodprints for the Future](#) campaign.

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Executive Summary

Food production is among the leading sources of the greenhouse gas emissions that cause global warming. Food production generates up to 30% of total global emissions^{1,2} and is also a significant contributor to biodiversity loss, deforestation, freshwater use, and land use change.³ The production of livestock generates the highest levels of greenhouse gas emissions, whereas the production of fruit and vegetables generates the lowest levels.⁴ Globally, changes to food production and consumption, including reducing food waste and shifting to a more plant-based diet,⁵ are critical to reducing global warming and other environmental impacts.³

Although a majority of Americans do not consider themselves to be vegetarians or vegans, most Americans are willing to eat more plant-based foods, and more than half are willing to eat less red meat.

- While only 4% of Americans say they are either vegan (1%) or vegetarian (3%), the vast majority (94%) say they are willing to eat more fruit and vegetables, with six in ten (62%) saying they are "very" willing.
- More than half of Americans (55%) say they are willing to eat more plant-based meat alternatives (products made with vegetables such as soy, potatoes, peas, etc.). About the same percentage (54%) say they are willing to eat less red meat (beef, lamb, pork). Nearly half (46%) say they are willing to use dairy alternatives (soy milk, almond milk, etc.) instead of dairy-based milk or cream. One in four Americans (26%) say they are willing to eat lab-grown meat rather than meat from animals.
- One in five Americans use plant-based dairy alternatives either about two to five times per week (10%) or more often (10%). About one in ten eat plant-based meat alternatives about two to five times per week (6%) or more often (3%).

Cost, taste, and convenience can be motivators or barriers to purchasing or eating plant-based foods.

- About half of Americans (49%) think a meal with a plant-based main course (fruit, vegetables, meat/dairy alternatives) is more expensive than a meat-based main course (beef, chicken, fish, etc.), while fewer think a plant-based main course is less expensive (14%).
- More than half of Americans (58%) say that it costs too much to buy plant-based foods, but 63% say they would be willing to eat more plant-based foods instead of meat if plant-based foods cost less than meat options.
- More than four in ten Americans (44%) say they don't like the taste of plant-based foods. However, two in three (67%) say they would be willing to eat more plant-based foods instead of meat if plant-based foods tasted better than they do today.
- About three out of four Americans (77%) say that ease and speed of preparation is at least "moderately" important to them when choosing to purchase or eat plant-based foods, and 44% say it's too much of an effort to buy plant-based foods.
- Nearly two-thirds of Americans (64%) say nobody has ever asked them to eat more plant-based foods. About half (51%) say they would be willing to eat more plant-based foods if they had more information about the environmental impact of different products and/or foods, and/or if their family and friends ate more plant-based foods instead of meat (50%).

Health is the top motivation for purchasing or eating plant-based foods, and a majority of Americans say environmental impacts are personally important.

- When asked about reasons (i.e., motivations) for purchasing or eating plant-based foods (fruit, vegetables, meat/dairy alternatives), majorities of Americans say the following are at least "moderately" important to them: their health (91%), how food companies affect the environment (71%), and/or helping to reduce global warming (64%).
- About one in four Americans (27%) say they have rewarded food companies that are taking steps to reduce their impact on the environment by buying their products at least once in the last 12 months.
- About one in five Americans (21%) say they have punished food companies that are not taking steps to reduce their impact on the environment by not buying their products over the last 12 months.

Lower-income Americans are more likely than middle- and higher-income Americans to say they lack access to nearby grocery stores and/or fresh produce.

- Lower-income Americans (households earning less than \$50,000 annually) are more likely to say they lack access to a nearby grocery store/market (20%) compared to middle- (11%) and higher-income (9%) Americans.
- About one in seven lower-income Americans (14%) say they lack access to fresh produce (fruit, vegetables) compared to 6% of middle- and 6% of higher-income Americans. More than half of lower-income Americans (53%) say it is too much of an effort to buy plant-based foods (vs. 45% of middle- and 37% of higher-income Americans), and 71% say it costs too much to buy plant-based foods (vs. 59% of middle- and 46% of higher-income Americans).

Although most Americans think that the production of meat contributes at least "a little" to global warming, many do not make the connection between food and global warming.

- More than half of Americans think that the production of beef, pork, dairy, and/or poultry contribute to global warming at least "a little," but only about one in four Americans (27%) think that beef contributes "a lot." Fewer Americans think the production of dairy (17%) contributes "a lot" to global warming. More than four in ten Americans think that beef does not contribute to global warming at all (23%) or do not know (20%). Similarly, 23% think that dairy products do not contribute to global warming at all and 23% do not know.
- Although most Americans think that if everyone ate a more plant-based diet it would reduce global warming at least "a little," more than four in ten Americans say it would not reduce global warming at all (23%) or do not know (19%).
- Three in ten Americans say they hear about the impact of food choices on global warming in the media either "at least once a month" (16%) or "at least once a week" (13%), while four in ten say they hear about it "once a year or less often" (11%) or "never" (29%).
- Most Americans say they "rarely" or "never" look for information about the environmental impact of different products and/or foods (65%), or talk to family and friends about the environmental impact of different products and/or foods (70%).

Although most Americans think reducing food waste and/or composting would reduce global warming at least "a little," many engage in food waste behavior, and most do not compost food waste.

- More than six in ten Americans think that if everyone threw away less food and/or composted food waste, it would reduce global warming at least "a little."
- About three in four Americans throw out uneaten or spoiled food "sometimes" (42%), "often" (24%), or "always" (10%) because they no longer want it or it went bad, while only about one in four say they do so "rarely" (21%) or "never" (2%).
- A majority of Americans say they "rarely" (16%) or "never" (56%) compost food waste, while only about three in ten Americans compost food waste "sometimes" (14%), "often" (9%) or "always" (6%).

Americans who are among the "Alarmed" or "Concerned" in [Global Warming's Six Americas](#)⁶ are more willing than other Americans to adopt a more plant-based diet and engage in pro-climate food behaviors. The Alarmed are the most willing and most engaged.

- More than six in ten of the Alarmed are willing to eat more plant-based meat alternatives (77% vs. 55% of the Concerned and 39% of all other Americans), eat less red meat (66% vs. 61% of the Concerned and 42% of all others), and/or use dairy alternatives instead of dairy-based milk or cream (63% vs. 47% of the Concerned and 33% of all others). About half of the Alarmed (49%) and Concerned (49%) are willing to eat less dairy (vs. 32% of all other Americans).
- More than half of the Alarmed look for information (57%) and/or talk to family and friends about the environmental impact of different products and/or foods (55%) at least "sometimes." In contrast, only 34% of the Concerned and 20% of all other Americans look for information about environmental impacts, and even fewer talk to family and friends about the issue at least "sometimes" (25% of the Concerned and 15% of all others).
- About half (52%) of the Alarmed have rewarded food companies that are taking steps to reduce their impact on the environment by buying their products at least once in the last year, compared to 22% of the Concerned and 13% of all other Americans.

¹https://www.ipcc.ch/site/assets/uploads/2018/02/ipcc_wg3_ar5_chapter11.pdf

²Vermeulen, S. J., Campbell, B. M., & Ingram, J. S. (2012). Climate change and food systems. *Annual Review of Environment and Resources*, 37, 195-222. doi: [10.1146/annurev-environ-020411-130608](https://doi.org/10.1146/annurev-environ-020411-130608)

³Willett, W., Rockström, J., Loken, B., Springmann, M., Lang, T., Vermeulen, S., ... & Jonell, M. (2019). Food in the Anthropocene: The EAT–Lancet Commission on healthy diets from sustainable food systems. *The Lancet*, 393(10170), 447-492. doi: [10.1016/S0140-6736\(18\)31788-4](https://doi.org/10.1016/S0140-6736(18)31788-4)

⁴Poore, J., & Nemecek, T. (2018). Reducing food's environmental impacts through producers and consumers. *Science*, 360(6392), 987-992. doi: [10.1126/science.aag0216](https://doi.org/10.1126/science.aag0216)

⁵<https://www.drawdown.org/solutions/food>

⁶<https://climatecommunication.yale.edu/about/projects/global-warmings-six-americas/>

1. Food Choices and Eating Habits

1.1. About half of Americans eat vegetables, grains, and/or dairy almost every day or more frequently.

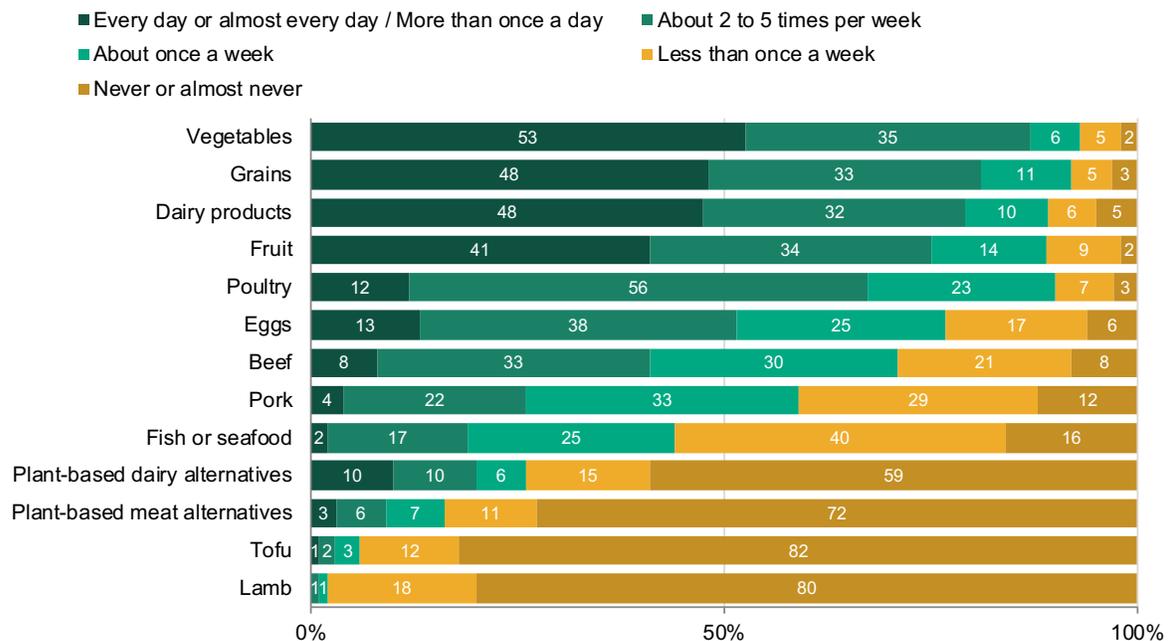
Americans, on average, report that they eat vegetables, grains, dairy, and fruit more frequently than they eat meat. Specifically, 53% of Americans say they eat vegetables almost every day or more frequently, and 48% say they eat grains (bread, pasta, rice, etc.) and/or dairy products (milk, cheese, etc.) at those rates. Forty-one percent of Americans say they eat fruit almost every day or more frequently.

In contrast, 13% of Americans say they eat eggs almost every day or more frequently, with an additional 38% eating eggs two to five times per week. Similarly, 12% of Americans eat poultry (chicken, turkey, etc.) almost every day or more frequently, with an additional 56% eating it two to five times per week. Eight percent of Americans say they eat beef (steak, ground beef, etc.) almost every day or more frequently and an additional 33% eat beef two to five times per week.

Fewer Americans eat plant-based meat/dairy alternatives. Ten percent of Americans use plant-based dairy alternatives (soy milk, almond milk, etc.) every day or more frequently, with an additional 10% using them two to five times per week. Only 3% of Americans eat plant-based meat alternatives (products made with soy, potatoes, peas, etc.) every day or more frequently, with an additional 6% eating them two to five times per week. Majorities of Americans say they "never or almost never" eat tofu (82%), plant-based meat alternatives (72%), or use plant-based dairy alternatives (59%).

Most Americans (81%) say they prefer meals with meat (beef, chicken, fish, etc.) and/or dairy, and 4% of Americans describe themselves as either "vegetarian" (3%) or "vegan" (1%; see Appendix I, p. 25).

About half of Americans eat vegetables, grains, and/or dairy almost every day or more frequently



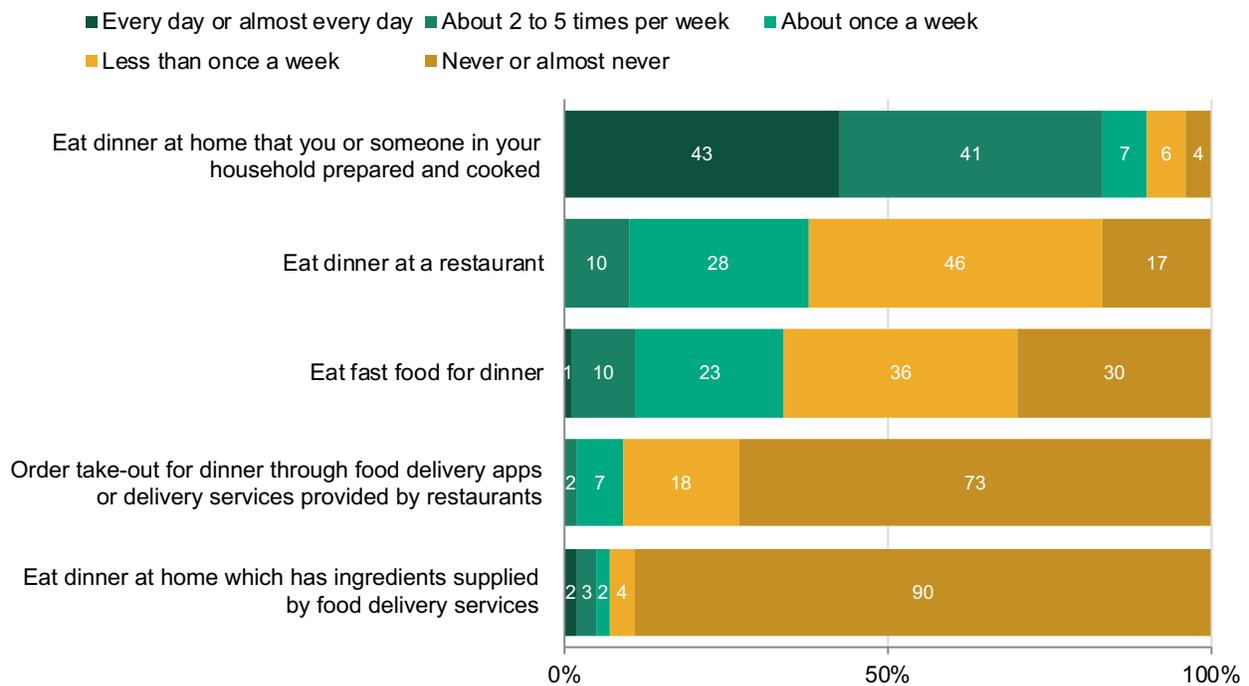
About how often do you eat the following:
December 2019. Base: 1,043 U.S. adults.

1.2. American most frequently eat home-cooked dinners.

Most Americans say they eat dinner that they or someone in their household prepared and cooked at home (excluding pre-made and frozen meals) either every day or almost every day (43%) or about two to five times per week (41%). Fewer say they eat fast food for dinner two to five times per week or more frequently (11%) or eat out for dinner at a restaurant (other than fast food) at that frequency (10%).

Few Americans say they frequently order take-out for dinner through food delivery apps (DoorDash, Uber Eats, etc.) or delivery services provided by restaurants, or eat dinner at home prepared with ingredients supplied by food delivery services (Blue Apron, Home Chef, etc.).

Americans most frequently eat home-cooked dinners



About how often do you do the following:
December 2019. Base: 1,043 U.S. adults.

2. Motivations for Purchasing and Eating Plant-Based Foods

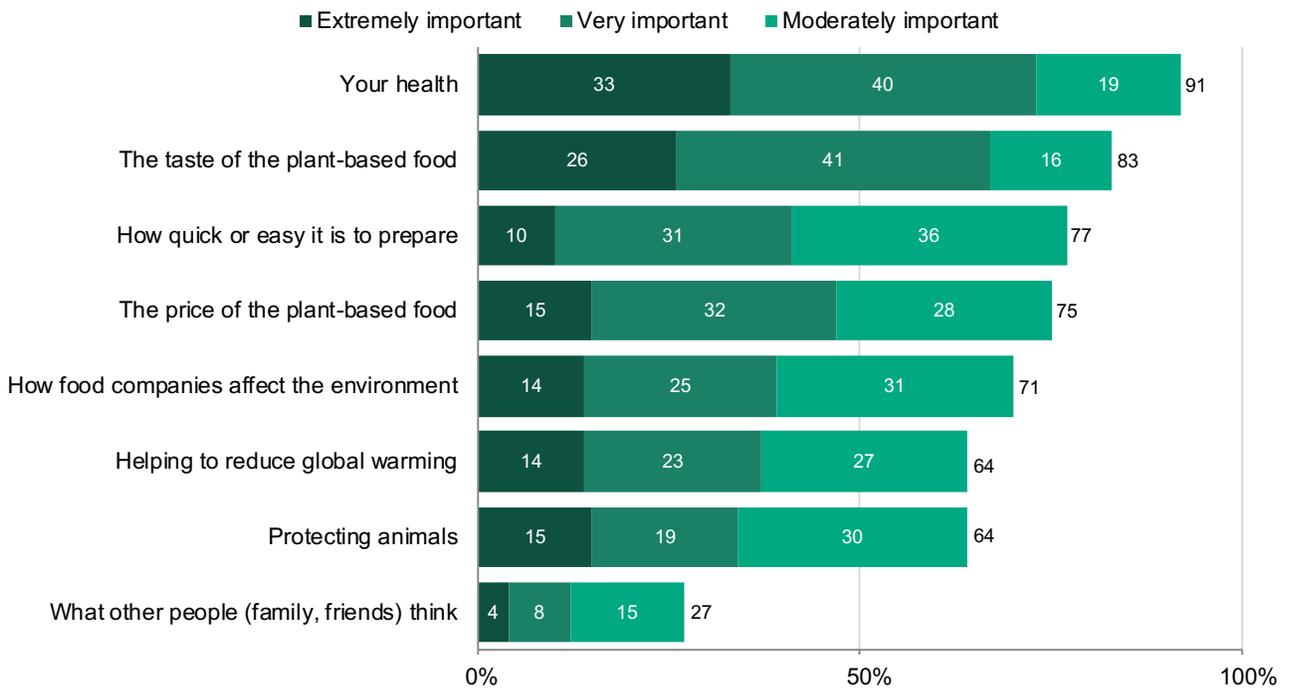
2.1. Health, taste, convenience, and price are most important to Americans when choosing to purchase or eat plant-based foods.

When asked about reasons (i.e., "motivations") for purchasing or eating plant-based foods (fruit, vegetables, meat/dairy alternatives), Americans generally indicate that individual motivations, including health, taste, convenience, and price, are more important to them than environmental motivations such as the environmental impacts of food products.

Nine in ten Americans (91%) say their health is at least a "moderately" important reason to purchase or eat plant-based foods, and about eight in ten (83%) say that taste is at least moderately important. Other reasons that are at least moderately important include how quick or easy plant-based foods are to prepare (77%), the price of plant-based food (75%), how food companies affect the environment (71%), helping to reduce global warming (64%), and protecting animals (64%). Only about one in four Americans (27%) say that what other people (family, friends) think is at least moderately important when they choose to purchase or eat plant-based foods.

Health, taste, convenience, and price are most important to Americans when choosing to purchase or eat plant-based foods

– A majority of Americans say helping to reduce global warming is personally important to them –



How important are each of the following to you personally, if at all, when you choose to purchase or eat plant-based foods (fruit, vegetables, meat/dairy alternatives)?

December 2019. Base: 1,043 U.S. adults.

Respondents (n = 1) who said they "never or almost never" eat vegetables, fruit, plant-based dairy alternatives, plant-based dairy alternatives, plant-based meat alternatives, tofu, and grains did not receive these questions.

3. Barriers to Purchasing and Eating Plant-Based Foods

3.1. Americans face several barriers to purchasing or eating plant-based foods.

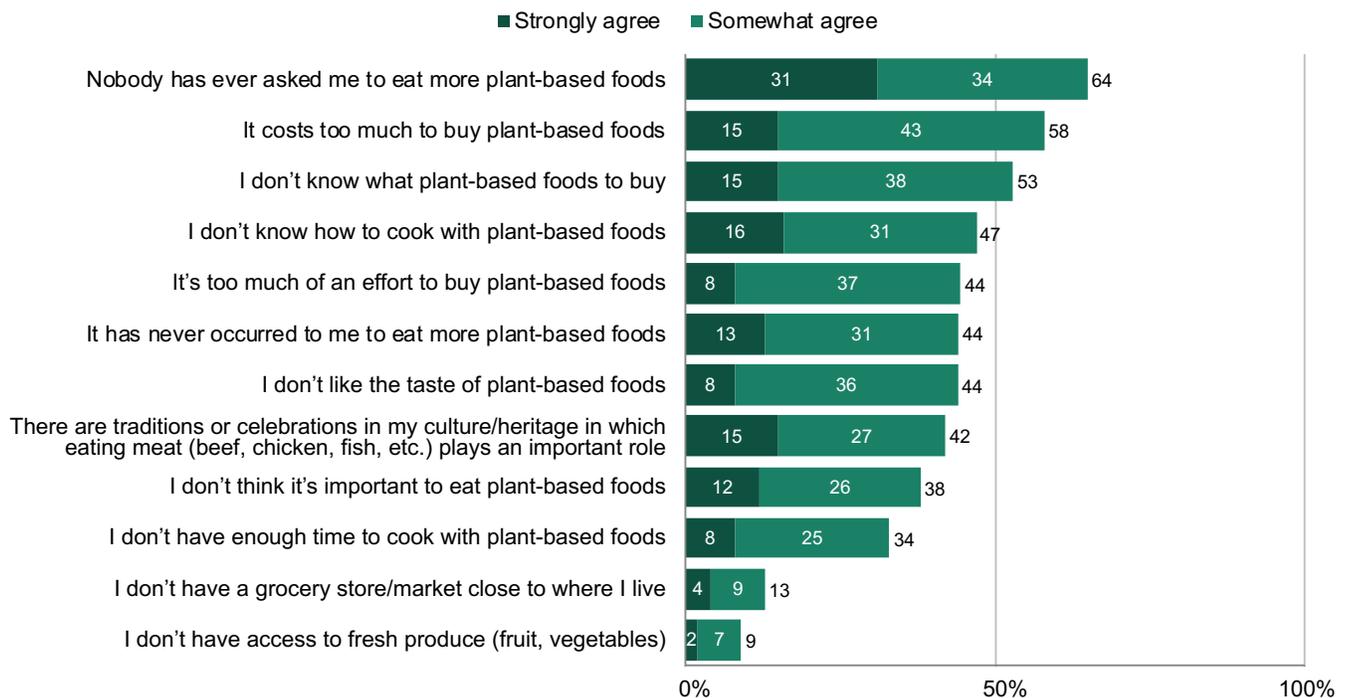
Many Americans face barriers to purchasing or eating plant-based foods, including structural, financial, informational, or psychological barriers. About one in eight Americans (13%) say they don't have a grocery store/market close to where they live, and 9% say they don't have access to fresh produce (fruit, vegetables).

Other barriers are more common. Nearly two-thirds of Americans (64%) say nobody has ever asked them to eat more plant-based foods, and more than half say that it costs too much to buy plant-based foods (58%) and/or that they don't know what plant-based foods to buy (53%).

Additionally, four in ten or more Americans say they don't know how to cook with plant-based foods (47%), that it's too much of an effort to buy plant-based foods (44%), that it has never occurred to them to eat more plant-based foods (44%), that they don't like the taste of plant-based foods (44%), and/or that there are traditions or celebrations in their culture/heritage in which eating meat plays an important role (42%). Nearly four in ten say they don't think it is important to eat plant-based foods (38%), and 34% say they don't have enough time to cook with plant-based foods.

Americans face several barriers to purchasing or eating plant-based foods

– Nearly two-thirds say nobody has ever asked them to eat more plant-based foods –



How strongly do you agree or disagree with each of the following statements regarding purchasing or eating plant-based foods (fruit, vegetables, meat/dairy alternatives)?

December 2019. Base: 1,043 U.S. adults.

Respondents (n = 13) who said they "never or almost never" eat beef, lamb, pork, poultry, and fish/seafood did not receive these questions.

3.2. Lower-income households face different barriers to purchasing or eating plant-based foods.

According to the United States Department of Agriculture (USDA), about 11% of households in the U.S. were food-insecure at least at some point during 2018, meaning that they were unable to access or were uncertain of having enough food for a healthy diet for all household members.⁷ Lower-income households had higher rates of food insecurity compared to the national average.

On average, Americans with an annual household income of less than \$50,000 are more likely than are Americans with higher household incomes to experience several barriers to purchasing or eating plant-based foods. Lower-income Americans are more likely to say they lack access to a nearby grocery store/market (20%) compared to middle- (11%) and higher-income Americans (9%). Lower-income Americans are also more likely to say they lack access to fresh produce (14% vs. 6% of both middle- and higher-income Americans), that it is too much of an effort to buy plant-based foods (53% vs. 45% of middle- and 37% of higher-income Americans), and/or that it costs too much to buy plant-based foods (71% vs. 59% of middle- and 46% of higher-income Americans).

A greater proportion of lower-income Americans also say they don't know what plant-based foods to buy (58% vs. 55% of middle- and 46% of higher-income Americans), don't know how to cook with plant-based foods (57% vs. 48% of middle- and 39% of higher-income Americans), and/or don't have enough time to cook with plant-based foods (44% vs. 33% of middle- and 25% of higher-income Americans). About half of lower- (52%) and middle-income (48%) Americans say it has never occurred to them to eat more plant-based foods, compared to 34% of those with higher incomes.

Lower-income households face different barriers to purchasing or eating plant-based foods

| Percent who "somewhat" or "strongly" agree... | Annual Household Income | | | | |
|--|-------------------------|-----------------|-----------------|----------------|---|
| | U.S. Population | Less than \$50k | \$50k - <\$100k | \$100k or more | |
| | % | % | % | % | |
| Nobody has ever asked me to eat more plant-based foods | 64 | 65 | 67 | 61 | |
| It costs too much to buy plant-based foods | 58 | 71 | 59 | 46 | * |
| I don't know what plant-based foods to buy | 53 | 58 | 55 | 46 | * |
| I don't know how to cook with plant-based foods | 47 | 57 | 48 | 39 | * |
| It's too much of an effort to buy plant-based foods | 44 | 53 | 45 | 37 | * |
| It has never occurred to me to eat more plant-based foods | 44 | 52 | 48 | 34 | * |
| I don't like the taste of plant-based foods | 44 | 44 | 45 | 43 | |
| There are traditions or celebrations in my culture/heritage in which eating meat (beef, chicken, fish, etc.) plays an important role | 42 | 44 | 40 | 40 | |
| I don't think it's important to eat plant-based foods | 38 | 39 | 38 | 38 | |
| I don't have enough time to cook with plant-based foods | 34 | 44 | 33 | 25 | * |
| I don't have a grocery store/market close to where I live | 13 | 20 | 11 | 9 | * |
| I don't have access to fresh produce (fruit, vegetables) | 9 | 14 | 6 | 6 | * |

How strongly do you agree or disagree with each of the following statements regarding purchasing or eating plant-based foods (fruit, vegetables, meat/dairy alternatives)?

December 2019. Base: 1,043 U.S. adults; Less than \$50k (n = 281); \$50k - <\$100k (n = 358); \$100k or more (n = 404)

*Individuals with lower household income are significantly more likely to agree than are individuals with higher household incomes (p < .001)

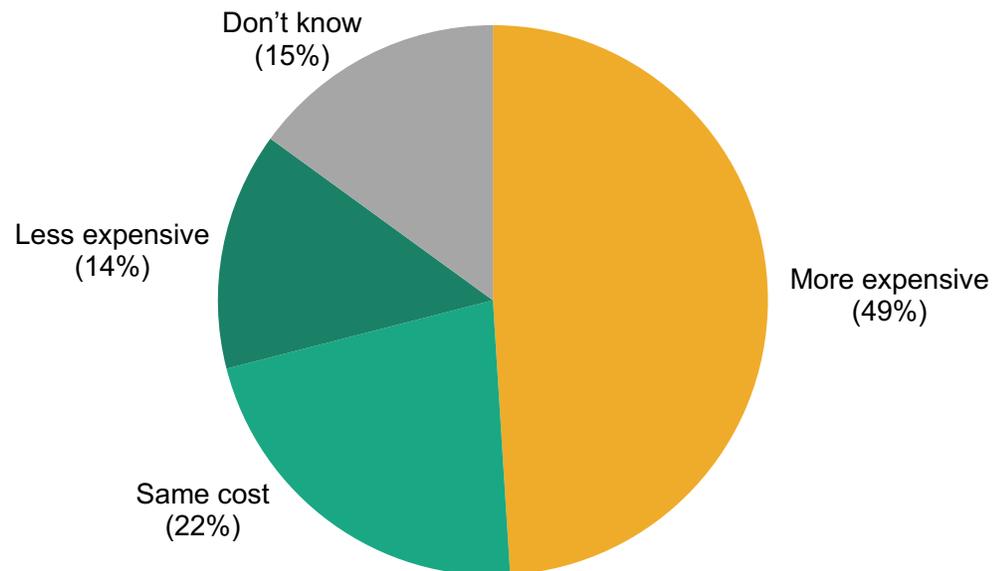
⁷<https://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-us/key-statistics-graphics/>

3.3. About half of Americans think a meal with a plant-based main course is more expensive than a meal with a meat-based main course.

According to the United States Department of Agriculture (USDA), the estimated price of foods depends on how cost is measured, such as the price per calorie or price per edible weight.⁸ When measured by the edible weight or average portion size of the food, on average, fruit, vegetables, and grains are less expensive than most meat-based foods (e.g., beef, pork, chicken).

About half of Americans (49%) think a meal with a plant-based main course (fruit, vegetables, meat/dairy alternatives) is more expensive than a meal with a meat-based main course (beef, chicken, fish, etc.). In contrast, only about one in seven Americans (14%) think a meal with a plant-based main course is less expensive than a meal with a meat-based main course. About one in five Americans (22%) think the two cost about the same, and 15% say they don't know.

About half of Americans think a meal with a plant-based main course is more expensive than a meal with a meat-based main course



Do you think a meal with a plant-based main course (fruit, vegetables, meat/dairy alternatives) is more expensive, less expensive, or about the same cost as a meal with a meat-based main course (beef, chicken, fish, etc.)?

December 2019. Base: 1,043 U.S. adults.

About half of lower-income Americans (earning a household income of less than \$50,000 annually) and middle-income Americans (earning between \$50,000 and \$99,999) think a meal with a plant-based main course is more expensive than a meal with a meat-based main course (53% and 52%, respectively), while higher-income Americans (earning more than \$100,000) are less likely to think so (42%; see Appendix I, p. 30).

⁸https://www.ers.usda.gov/webdocs/publications/44678/19980_eib96.pdf?v=42321

4. Willingness to Make Dietary Changes

4.1. Most Americans are willing to eat more plant-based foods, more plant-based meat alternatives, and/or less red meat.

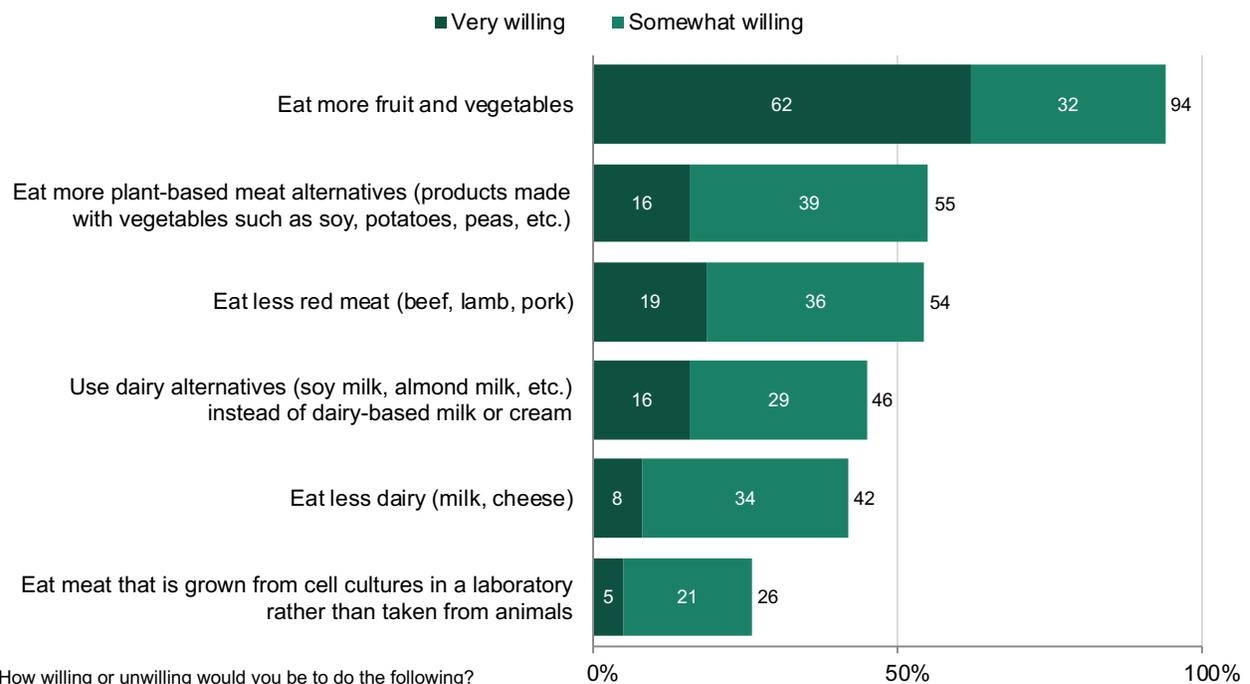
Although Americans report several barriers to purchasing and eating plant-based foods (see Section 3.1, above), majorities of Americans say they are willing to make changes to their diets to increase their consumption of plant-based foods and decrease their consumption of meat. More than nine in ten Americans (94%) say they are willing to eat more fruit and vegetables, and six in ten (62%) say they are "very" willing to do so. More than half of Americans (55%) say they are willing to eat more plant-based meat alternatives (products made with vegetables such as soy, potatoes, peas, etc.) and 54% say they are willing to eat less red meat (beef, lamb, pork).

More than four in ten Americans say they are willing to use dairy alternatives (soy milk, almond milk, etc.) instead of dairy-based milk or cream (46%) and/or to consume less dairy (42%).

One in four Americans (26%) say they are willing to eat lab-grown meat rather than meat taken from animals.

Most Americans are willing to eat more plant-based foods, more plant-based meat alternatives, and/or less red meat

– More than nine in ten Americans are willing to eat more fruit and vegetables –



How willing or unwilling would you be to do the following?

December 2019. Base: 1,043 U.S. adults.

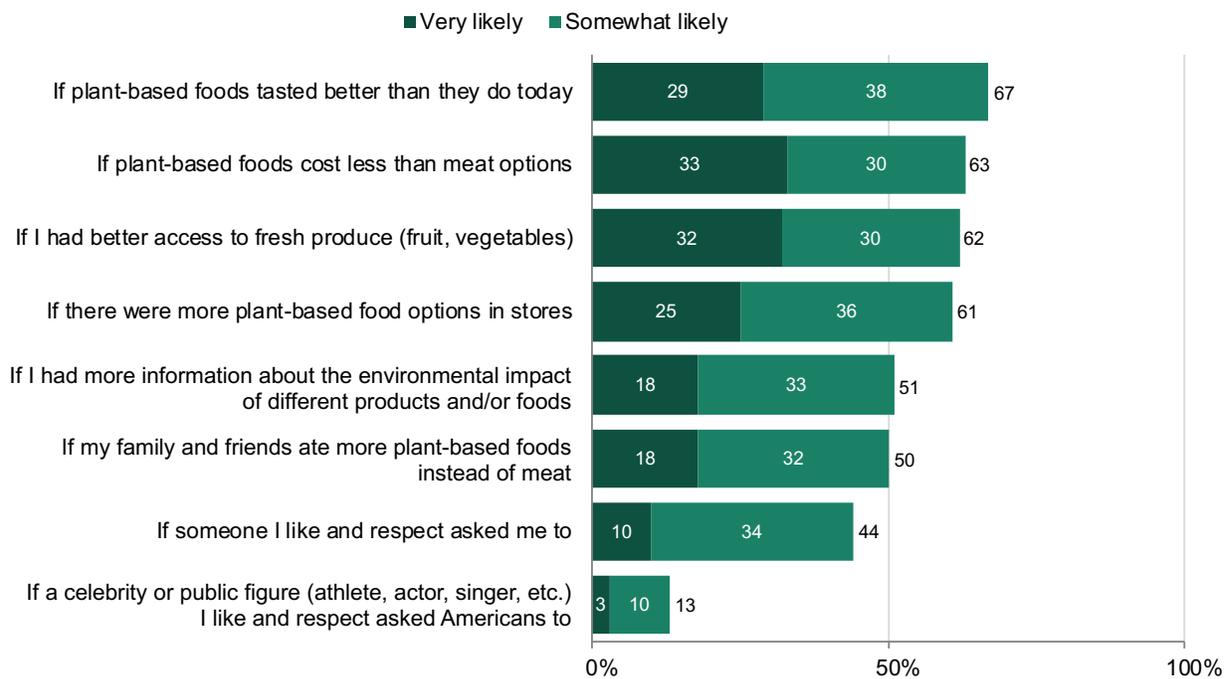
Respondents (n = 48) who said they "never or almost never" eat red meat products (beef, lamb, and pork) did not receive the question about eating less red meat, and respondents (n = 46) who said they "never or almost never" eat dairy products did not receive the two questions about using/eating less dairy.

4.2. A majority of Americans say they would be likely to eat more plant-based foods instead of meat if plant-based foods tasted better, cost less than meat options, and/or were more accessible.

Two in three Americans (67%) say they would eat more plant-based foods (fruit, vegetables, meat/dairy alternatives) instead of meat (beef, chicken, fish, etc.) if plant-based foods tasted better than they do today. Additionally, about six in ten Americans say they would eat more plant-based foods instead of meat if plant-based foods cost less than meat options (63%), if they had better access to fresh produce (62%), and/or if there were more plant-based food options in stores (61%).

About half of Americans say they would eat more plant-based foods if they had more information about the environmental impact of different products and/or foods (51%), and/or if their family and friends ate more plant-based foods instead of meat (50%). More than four in ten Americans (44%) say they would eat more plant-based foods if someone they like and respect asked them to, but only 13% say they would do so if a celebrity or public figure (athlete, actor, singer, etc.) they like and respect asked Americans to.

A majority of Americans say they would be likely to eat more plant-based foods instead of meat if plant-based foods tasted better, cost less than meat options, and/or were more accessible



How likely or unlikely is it that you would eat more plant-based foods (fruit, vegetables, meat/dairy alternatives) instead of meat (beef, chicken, fish, etc.) if the following happened?

December 2019. Base: 1,043 U.S. adults.

Respondents (n = 13) who said they "never or almost never" eat beef, lamb, pork, poultry, and fish/seafood did not receive these questions.

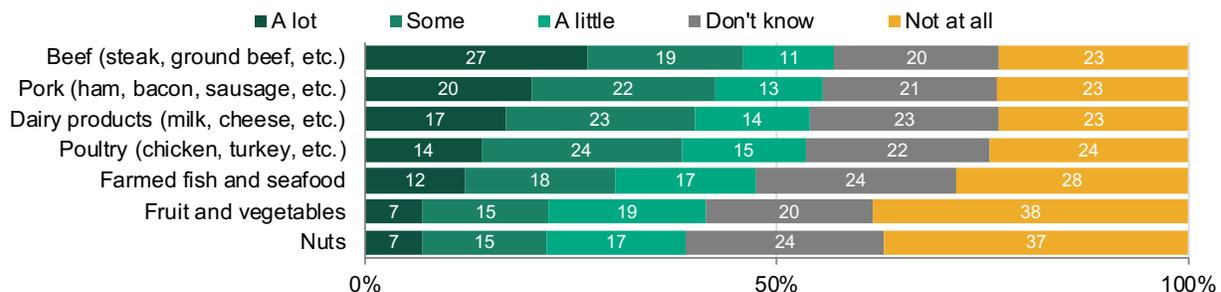
5. Awareness of Food's Connection to Global Warming

5.1. More than half of Americans think the production of beef, pork, dairy, and/or poultry contributes at least a little to global warming.

Food production generates up to 30% of total greenhouse gas emissions globally.^{9,10} Food production is also a significant contributor to biodiversity loss, deforestation, freshwater use, and land-use change.¹¹ The production of livestock primarily raised for beef and dairy generates the most greenhouse gas emissions compared to other foods.^{10,11,12,13} According to the Food and Agriculture Organization of the United Nations, the production of livestock accounts for 14.5% of greenhouse gas emissions around the globe.¹² The production of beef, lamb, and dairy, as well as farm-raised crustaceans (e.g., shrimp, crab, lobster), tend to generate the highest greenhouse gas emissions per gram of protein compared to other food products, including pork and poultry, whereas plant-based foods (e.g., fruit, vegetables, nuts) tend to produce the lowest emissions.¹³

More than half of Americans think the production of beef, pork, dairy, and/or poultry contributes at least a little to global warming

– But many think meat and/or dairy do not contribute to global warming at all or do not know –



How much do you think the production of the following foods contributes to global warming, if at all?

December 2019. Base: 1,043 U.S. adults.

More than half of Americans think beef, pork, dairy, and/or poultry contribute at least "a little" to global warming. However, only about one in four Americans (27%) think that the production of beef contributes "a lot" to global warming, and one in five (20%) think the same about the production of pork. Fewer Americans think the production of dairy (17%), poultry (14%), and/or farmed fish and seafood (12%) contribute "a lot" to global warming. Americans are less likely to think that fruit and vegetables, and/or nuts contribute to global warming; nearly four in ten Americans think fruit and vegetables (38%), and/or nuts (37%) do not contribute at all.

More than one in five Americans do not think that the production of meat (e.g., beef, pork, farmed fish and seafood) and/or dairy contributes at all to global warming, and more than one in five, on average, do not know. These results indicate that many Americans are unaware of agriculture's contribution to global warming.

⁹https://www.ipcc.ch/site/assets/uploads/2018/02/ipcc_wg3_ar5_chapter11.pdf

¹⁰Vermeulen, S. J., Campbell, B. M., & Ingram, J. S. (2012). Climate change and food systems. *Annual Review of Environment and Resources*, 37, 195-222. doi: [10.1146/annurev-environ-020411-130608](https://doi.org/10.1146/annurev-environ-020411-130608)

¹¹Willett, W., Rockström, J., Loken, B., Springmann, M., Lang, T., Vermeulen, S., ... & Jonell, M. (2019). Food in the Anthropocene: The EAT–Lancet Commission on healthy diets from sustainable food systems. *The Lancet*, 393(10170), 447-492. doi: [10.1016/S0140-6736\(18\)31788-4](https://doi.org/10.1016/S0140-6736(18)31788-4)

¹²<http://www.fao.org/3/i3437e/i3437e.pdf>

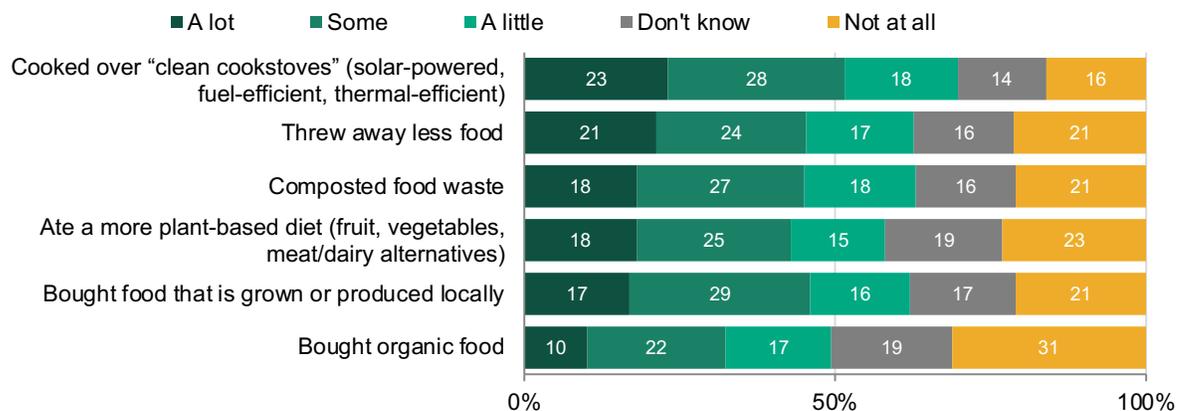
¹³Poore, J., & Nemecek, T. (2018). Reducing food's environmental impacts through producers and consumers. *Science*, 360(6392), 987-992. doi: [10.1126/science.aag0216](https://doi.org/10.1126/science.aag0216)

5.2. Most Americans think that cooking over "clean cookstoves," reducing food waste, composting food waste, and/or eating a more plant-based diet would reduce global warming at least a little.

Changing food production and consumption systems globally could greatly reduce their environmental impacts and the emissions that cause global warming.¹⁴ Research finds that out of 80 global warming solutions, decreasing food waste is ranked third, and shifting to a diet rich in plant-based foods ranks fourth.¹⁵ Compared to other diets, vegetarian and vegan diets have been linked to the greatest reductions in greenhouse gas emissions.^{16,17} Two other food-related behavioral solutions include cooking over "clean cookstoves" (e.g., solar-powered, fuel-efficient, thermal-efficient; ranked 21st) and composting food waste (ranked 60th).¹⁵

Most Americans think that cooking over "clean cookstoves," reducing food waste, composting food waste, and/or eating a more plant-based diet would reduce global warming at least a little

– Three in ten or more Americans say "not at all" or "don't know" –



If everyone did the following, how much do you think it would reduce global warming, if at all?

December 2019. Base: 1,043 U.S. adults.

Most Americans think that if everyone adopted these food-related behaviors it would reduce global warming at least "a little." Americans are more likely to say that cooking over clean cookstoves would reduce global warming compared to the other food-related solutions. One in five or fewer Americans think that everyone reducing food waste (21%), eating a more plant-based diet (18%), composting food waste (18%), and/or buying food that is grown or produced locally (17%) would reduce global warming "a lot." Fewer Americans (10%) think that everyone buying organic food would reduce global warming "a lot," and 31% say it would not reduce global warming at all.

Three in ten or more Americans say "not at all" or "don't know" regarding each of these solutions, suggesting that many are unaware of the impact certain food-related actions, particularly reducing food waste and eating more plant-based foods, can have on global warming.

¹⁴Willett, W., Rockström, J., Loken, B., Springmann, M., Lang, T., Vermeulen, S., ... & Jonell, M. (2019). Food in the Anthropocene: The EAT–Lancet Commission on healthy diets from sustainable food systems. *The Lancet*, 393(10170), 447-492. doi: [10.1016/S0140-6736\(18\)31788-4](https://doi.org/10.1016/S0140-6736(18)31788-4)

¹⁵<https://www.drawdown.org/solutions/food>

¹⁶Peters, C. J., Picardy, J., Wilkins, J. L., Griffin, T. S., Fick, G. W., & Darrouzet-Nardi, A. F. (2016). Carrying capacity of US agricultural land: Ten diet scenarios. *Elementa: Science of the Anthropocene*, 4(1), 1-15. doi: [10.12952/journal.elementa.000116](https://doi.org/10.12952/journal.elementa.000116)

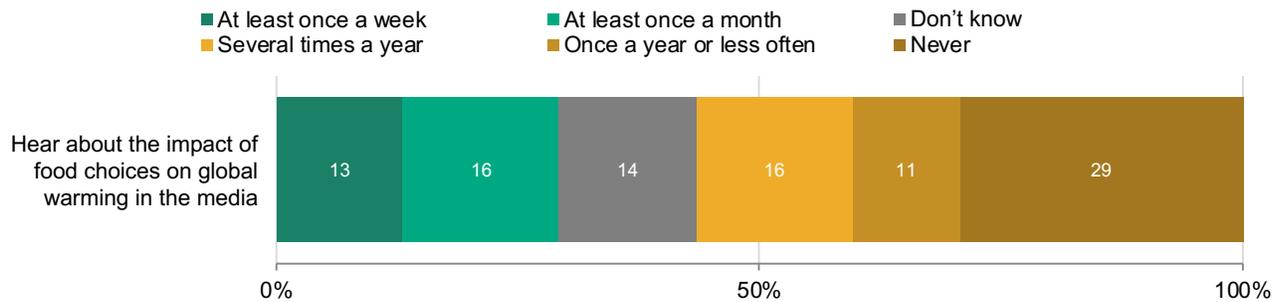
¹⁷Tilman, D., & Clark, M. (2014). Global diets link environmental sustainability and human health. *Nature*, 515(7528), 518-522. doi: [10.1038/nature13959](https://doi.org/10.1038/nature13959)

5.3. Three in ten Americans say they hear about the impact of food choices on global warming in the media once a month or more often.

Three in ten Americans say they hear about the impact of food choices on global warming in the media either "at least once a month" (16%) or "at least once a week" (13%). About one in four Americans say they hear about it in the media only "several times a year" (16%) or "once a year or less often" (11%), and 29% say they "never" hear about it.

Three in ten Americans say they hear about the impact of food choices on global warming in the media once a month or more often

– Nearly three in ten say they never hear about it –



How often do you hear about the impact of food choices on global warming in the media (TV, movies, radio, newspapers/news websites, magazines, etc.)?

December 2019. Base: 1,043 U.S. adults.

6. Food-Related Choices and Actions

6.1. About three in four Americans throw out uneaten or spoiled food because they no longer want it or it went bad.

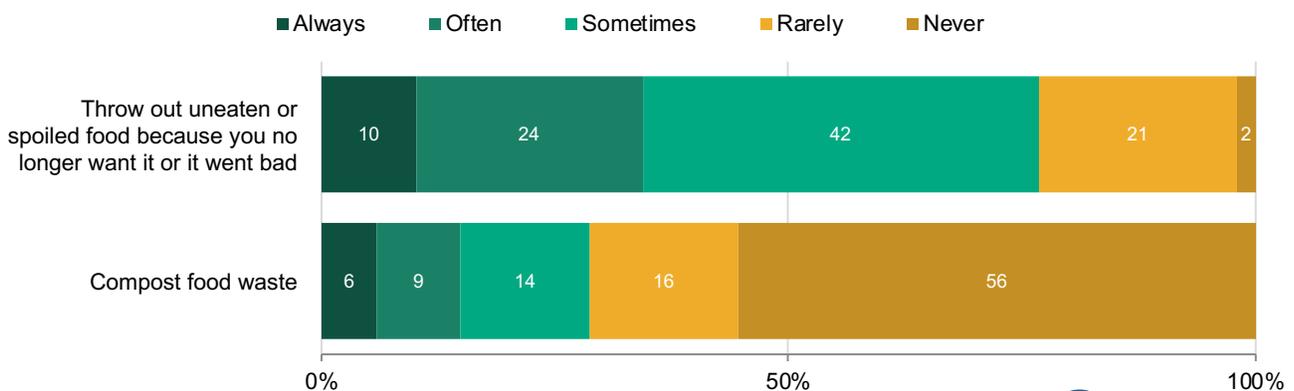
According to the Food and Agriculture Organization of the United Nations, about one-third of the food produced globally for human consumption is lost or wasted every year, accounting for 8% of global greenhouse gas emissions related to human activity.¹⁸ Food loss refers to food that spills or spoils before it reaches the consumer, and food waste refers to food that reaches retailers or the consumer but is not consumed. The United States Department of Agriculture (USDA) estimates that food loss and waste account for 30% to 40% of the U.S. food supply.¹⁹

About three in four Americans throw out uneaten or spoiled food "sometimes" (42%), "often" (24%), or "always" (10%) because they no longer want it or it went bad. Only about one in four Americans say they do so "rarely" (21%) or "never" (2%).

Nearly three in ten Americans compost food waste either "sometimes" (14%), "often" (9%) or "always" (6%). However, a majority of Americans say they "rarely" (16%) or "never" (56%) compost food waste.

About three in four Americans throw out uneaten or spoiled food because they no longer want it or it went bad

– Most Americans rarely or never compost food waste –



How often do you do the following things?

December 2019. Base: 1,043 U.S. adults.

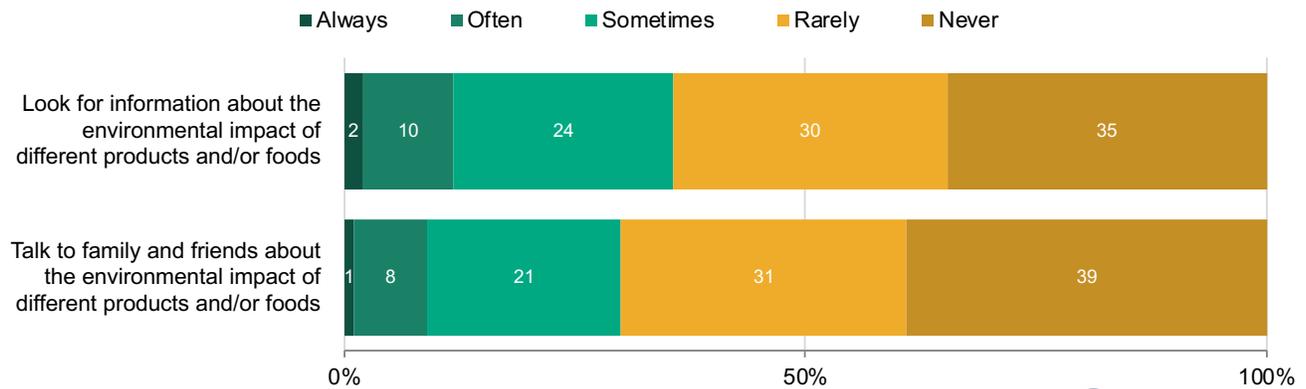
¹⁸<http://www.fao.org/save-food/resources/keyfindings/en/>

¹⁹<https://www.usda.gov/foodwaste/faqs>

6.2. Most Americans rarely or never look for information about the environmental impact of foods and/or talk to family and friends about it.

About one in three Americans look for information about the environmental impact of different products and/or foods either "sometimes" (24%), "often" (10%), or "always" (2%). However, most Americans say they do so "rarely" (30%) or "never" (35%). Three in ten Americans talk to family and friends about the environmental impact of different products and/or foods either "sometimes" (21%), "often" (8%), or "always" (1%), while most Americans say they do so "rarely" (31%) or "never" (39%).

Most Americans rarely or never look for information about the environmental impact of foods and/or talk to family and friends about it

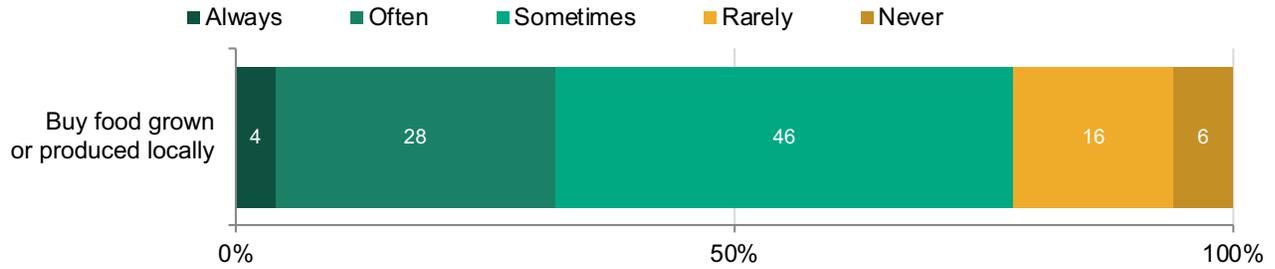


How often do you do the following things?
December 2019. Base: 1,043 U.S. adults.

6.3. Most Americans buy food grown or produced locally sometimes or more often.

Nearly one in three Americans say they buy food grown or produced locally either "often" (28%) or "always" (4%) and an additional 46% of Americans say they do so "sometimes." About one in five Americans say they either "rarely" (16%) or "never" (6%) buy locally sourced food.

Most Americans buy food grown or produced locally sometimes or more often



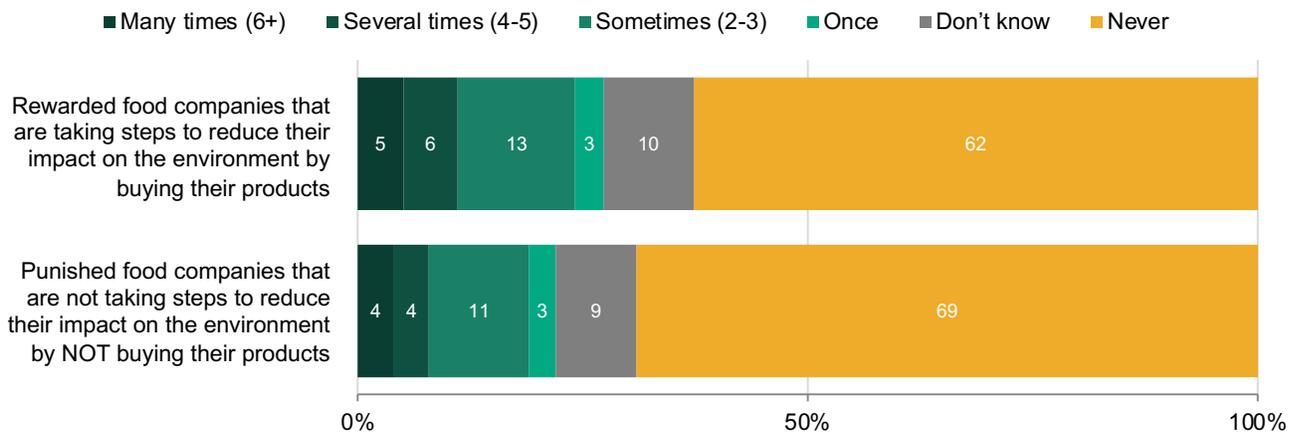
How often do you do the following things?
December 2019. Base: 1,043 U.S. adults.

6.4. About one in four Americans have rewarded food companies for their environmental actions at least once in the past year by buying their products.

About one in four Americans (27%) say they have rewarded food companies that are taking steps to reduce their impact on the environment by buying their products at least once in the last 12 months. About one in five Americans (21%) say they have punished food companies that are not taking steps to reduce their impact on the environment by not buying their products. However, most Americans say they have "never" rewarded (62%) or punished (69%) food companies for their environmental actions.

About one in four Americans have rewarded food companies for their environmental actions at least once in the past year by buying their products

– Most say they have never rewarded or punished food companies for their environmental actions –



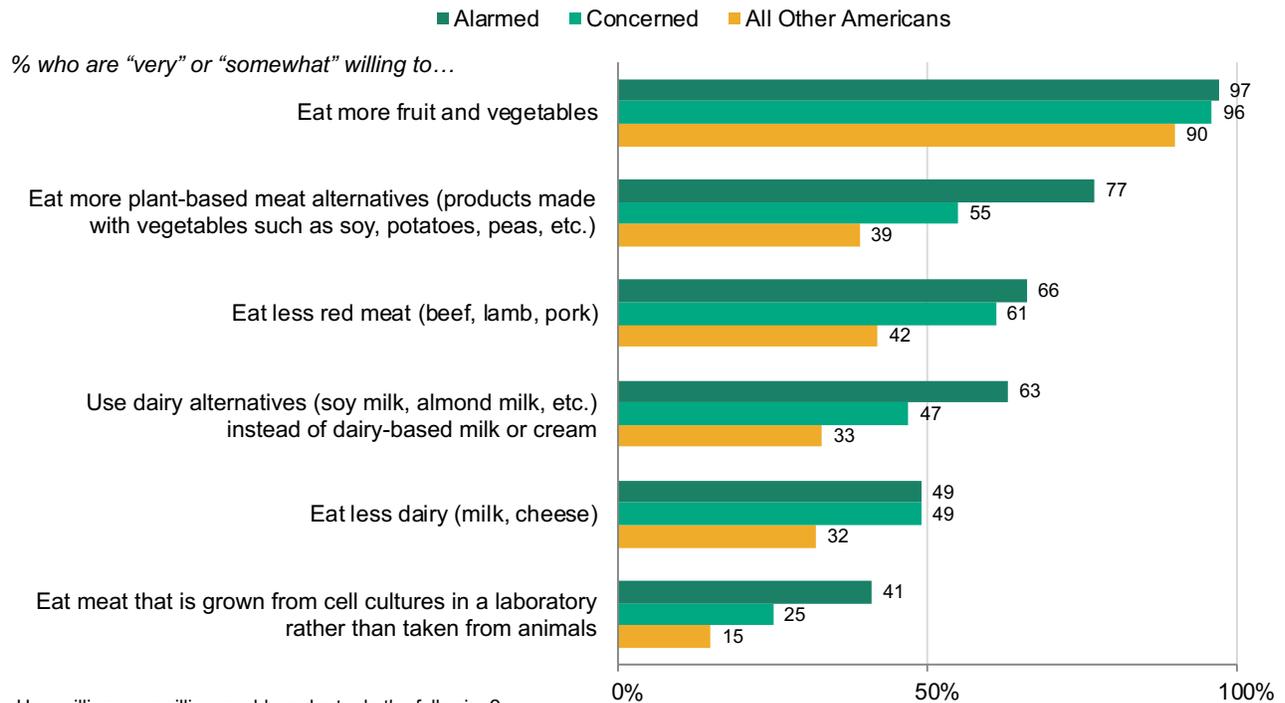
Over the past 12 months, how many times have you done the following?
December 2019. Base: 1,043 U.S. adults.

7. Global Warming Beliefs and Food-Related Intentions and Actions

7.1. Alarmed and Concerned Americans are more willing than other Americans to adopt a more plant-based diet.

Prior research has found that Americans can be categorized into six distinct groups based on their climate change beliefs, attitudes, and actions ([Global Warming's Six Americas](#)).^{20,21} Americans who are "Alarmed" have the highest levels of acceptance and concern about global warming and are the most supportive of pro-climate policies and actions. The "Concerned" also believe that global warming is happening and is a serious – but more distant – threat, so it is viewed as less urgent. The "Cautious," "Disengaged," and "Doubtful" are at different stages of understanding the problem, and none are actively engaged with the issue, while the "Dismissive" typically reject the reality, human causation, and seriousness of global warming, and oppose climate action.

Alarmed and Concerned Americans are more willing than other Americans to adopt a more plant-based diet



How willing or unwilling would you be to do the following?

December 2019. Base: 1,043 U.S. adults. (Alarmed *n* = 295; Concerned *n* = 296; All Other Americans: Cautious/Disengaged/Doubtful/Dismissive *n* = 452)

Respondents (*n* = 48) who said they "never or almost never" eat red meat products (beef, lamb, and pork) did not receive the question about eating less red meat, and respondents (*n* = 46) who said they "never or almost never" eat dairy products did not receive the two questions about using/eating less dairy.

The Alarmed and Concerned are more willing to adopt a more plant-based (and therefore climate-friendly) diet than are other Americans (the Cautious, Disengaged, Doubtful, and Dismissive). Nearly all of the Alarmed (97%) and Concerned (96%) are willing to eat more fruit and vegetables compared to 90% of all other Americans. Large majorities of the Alarmed are willing to eat more plant-based meat alternatives (77% vs. 55%

of the Concerned and 39% of all others), eat less red meat (66% vs. 61% of the Concerned and 42% of all others), and/or use dairy alternatives instead of dairy-based milk or cream (63% vs. 47% of the Concerned and 33% of all others). About half of the Alarmed (49%) and Concerned (49%) are willing to eat less dairy, compared to 32% of all other Americans.

Four in ten Alarmed Americans (41%) are willing to eat lab-grown meat rather than meat taken from animals, while 25% of the Concerned and 15% of all other Americans are willing to do so.

²⁰<https://climatecommunication.yale.edu/about/projects/global-warmings-six-americas/>

²¹<https://climatecommunication.yale.edu/visualizations-data/sassy/>

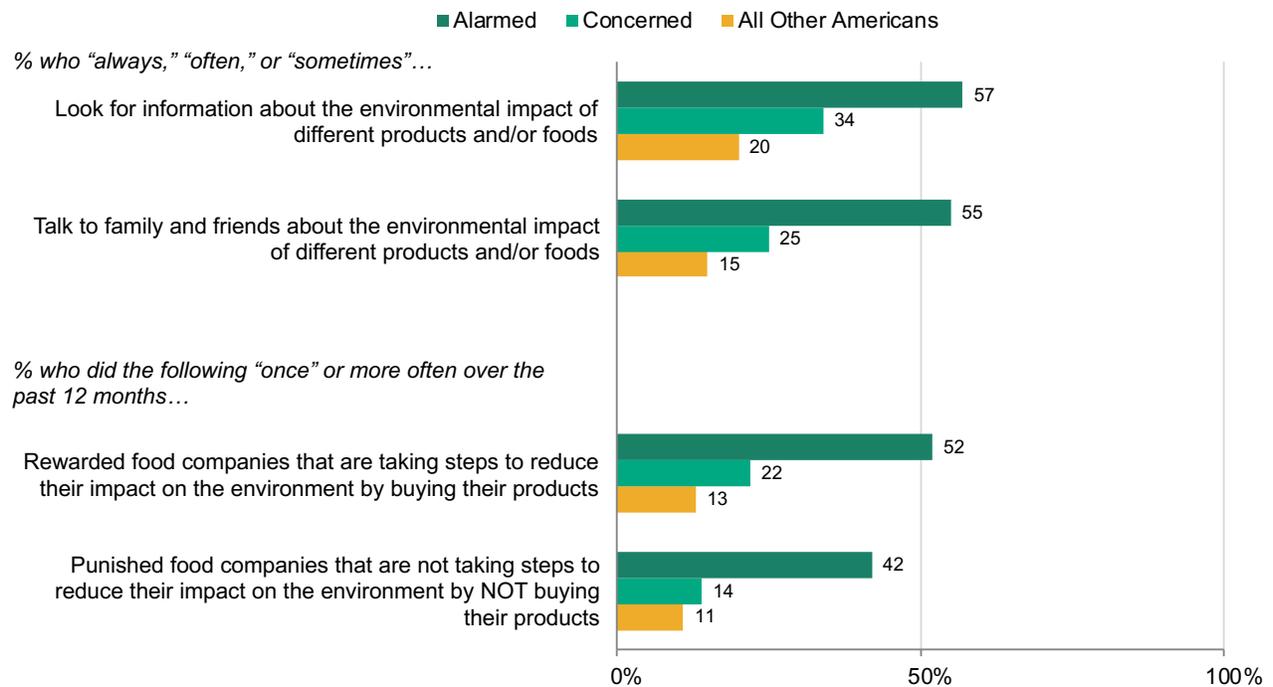
7.2. More than half of Alarmed Americans frequently look for information and/or talk to family and friends about the environmental impact of different products and/or foods.

More than half of the Alarmed "always," "often," or "sometimes" look for information about the environmental impact of different products and/or foods (57%) and/or talk to family and friends about the environmental impact of different products and/or foods (55%). In contrast, 34% of the Concerned and 20% of all other Americans look for information about environmental impacts at this rate, and even fewer talk to family and friends about the issue (25% of the Concerned and 15% of all others).

The Alarmed are also more likely than other Americans to have rewarded and/or punished food companies for their environmental actions. About half of the Alarmed (52%) have rewarded food companies that are taking steps to reduce their impact on the environment by buying their products at least once in the last year, and 42% have punished food companies that are not taking steps by not buying their products. Only 22% of the Concerned and 13% of all other Americans have rewarded food companies for their environmental actions, and fewer (14% of the Concerned and 11% of all others) have punished food companies.

More than half of Alarmed Americans frequently look for information and/or talk to family and friends about the environmental impact of different products and/or foods

– The Alarmed reward and/or punish food companies for their environmental actions more than other Americans –



How often do you do the following things?

Over the past 12 months, how many times have you done the following?

December 2019. Base: 1,043 U.S. adults. (Alarmed *n* = 295; Concerned *n* = 296; All Other Americans: Cautious/Disengaged/Doubtful/Dismissive *n* = 452)

Appendix I: Data Tables

Note: In the data tables, -- denotes that there were no responses in that cell, whereas * denotes that the value is > 0 but < 0.5.

(Base: 1,043 Americans 18+)

About how often do you eat the following:

| | More than once a day (%) | Every day or almost every day (%) | About 2 to 5 times per week (%) | About once a week (%) | Less than once a week (%) | Never or almost never (%) | Refused (%) |
|---|--------------------------|-----------------------------------|---------------------------------|-----------------------|---------------------------|---------------------------|-------------|
| Vegetables | 14 | 39 | 35 | 6 | 5 | 2 | -- |
| Grains (bread, pasta, rice, etc.) | 12 | 37 | 33 | 11 | 5 | 3 | -- |
| Dairy products (milk, cheese, etc.) | 11 | 36 | 32 | 10 | 6 | 5 | * |
| Fruit | 13 | 28 | 34 | 14 | 9 | 2 | * |
| Poultry (chicken, turkey, etc.) | 1 | 11 | 56 | 23 | 7 | 3 | * |
| Eggs | 1 | 12 | 38 | 25 | 17 | 6 | -- |
| Beef (steak, ground beef, etc.) | 1 | 7 | 33 | 30 | 21 | 8 | * |
| Pork (ham, bacon, sausage, etc.) | * | 3 | 22 | 33 | 29 | 12 | * |
| Fish or seafood | * | 2 | 17 | 25 | 40 | 16 | -- |
| Plant-based dairy alternatives (soy milk, almond milk, etc.) | 2 | 8 | 10 | 6 | 15 | 59 | -- |
| Plant-based meat alternatives (products made with vegetables such as soy, potatoes, peas, etc.) | * | 3 | 6 | 7 | 11 | 72 | -- |
| Tofu | * | * | 2 | 3 | 12 | 82 | -- |
| Lamb | * | * | 1 | 1 | 18 | 80 | -- |

(Base: 1,043 Americans 18+)

Do you consider yourself a vegan or vegetarian?

| | % |
|--|----|
| Vegan | 1 |
| Vegetarian | 3 |
| I describe my dietary choices in a different way (Please specify): | 2 |
| I am neither vegan nor vegetarian | 94 |
| Refused | * |

(Base: 1,043 Americans 18+)

How strongly do you agree or disagree with each of the following statements regarding purchasing or eating plant-based foods (fruit, vegetables, meat/dairy alternatives)?

I prefer meals with meat (beef, chicken, fish, etc.) and/or dairy.

| | % |
|---|----|
| Strongly agree (%) | 42 |
| Somewhat agree (%) | 39 |
| Somewhat disagree (%) | 12 |
| Strongly disagree (%) | 5 |
| Refused/Not applicable ^a (%) | 2 |

(Base: 1,043 Americans 18+)**About how often do you do the following:**

| | Every day or almost every day (%) | About 2 to 5 times per week (%) | About once a week (%) | Less than once a week (%) | Never or almost never (%) | Refused (%) |
|---|-----------------------------------|---------------------------------|-----------------------|---------------------------|---------------------------|-------------|
| Eat dinner at home that you or someone in your household prepared and cooked (excluding pre-made and frozen meals) | 43 | 41 | 7 | 6 | 4 | * |
| Eat dinner at a restaurant (other than fast food) | * | 10 | 28 | 46 | 17 | |
| Eat fast food for dinner (McDonald's, KFC, Taco Bell, etc.) | 1 | 10 | 23 | 36 | 30 | * |
| Order take-out for dinner through food delivery apps (DoorDash, Uber Eats, etc.) or delivery services provided by restaurants | * | 2 | 7 | 18 | 73 | * |
| Eat dinner at home which has ingredients supplied by food delivery services (Blue Apron, Home Chef, etc.) | 2 | 3 | 2 | 4 | 90 | * |

(Base: 1,043 Americans 18+)**How important are each of the following to you personally, if at all, when you choose to purchase or eat plant-based foods (fruit, vegetables, meat/dairy alternatives)?**

| | Extremely important (%) | Very important (%) | Moderately important (%) | Not too important (%) | Not at all important (%) | Refused/Not applicable ^a (%) |
|---|-------------------------|--------------------|--------------------------|-----------------------|--------------------------|---|
| Your health | 33 | 40 | 19 | 3 | 6 | * |
| The taste of the plant-based food | 26 | 41 | 16 | 6 | 10 | * |
| How quick or easy it is to prepare | 10 | 31 | 36 | 11 | 11 | * |
| The price of the plant-based food | 15 | 32 | 28 | 11 | 14 | * |
| How food companies affect the environment | 14 | 25 | 31 | 15 | 14 | * |
| Helping to reduce global warming | 14 | 23 | 27 | 16 | 20 | * |
| Protecting animals | 15 | 19 | 30 | 18 | 18 | * |
| What other people (family, friends) think | 4 | 8 | 15 | 27 | 46 | * |

^aRespondents ($n = 1$) who said they "never or almost never" eat the following plant-based foods – vegetables, fruit, plant-based dairy alternatives, plant-based dairy alternatives, plant-based meat alternatives, tofu, and grains – did not receive these questions.

(Base: 1,043 Americans 18+)**How strongly do you agree or disagree with each of the following statements regarding purchasing or eating plant-based foods (fruit, vegetables, meat/dairy alternatives)?**

Nobody has ever asked me to eat more plant-based foods.

| | U.S. Population | Annual Household Income | | |
|---|-----------------|-------------------------|-------------------|----------------|
| | | Less than \$50k | \$50k – \$99,999k | \$100k or more |
| <i>n</i> | 1,043 | 281 | 358 | 404 |
| Strongly agree (%) | 31 | 31 | 33 | 29 |
| Somewhat agree (%) | 34 | 34 | 34 | 33 |
| Somewhat disagree (%) | 20 | 18 | 19 | 21 |
| Strongly disagree (%) | 13 | 14 | 11 | 15 |
| Refused/Not applicable ^a (%) | 2 | 2 | 3 | 3 |

It costs too much to buy plant-based foods.

| | U.S. Population | Annual Household Income | | |
|---|-----------------|-------------------------|-------------------|----------------|
| | | Less than \$50k | \$50k – \$99,999k | \$100k or more |
| <i>n</i> | 1,043 | 281 | 358 | 404 |
| Strongly agree (%) | 15 | 19 | 15 | 11 |
| Somewhat agree (%) | 43 | 52 | 44 | 35 |
| Somewhat disagree (%) | 27 | 19 | 27 | 34 |
| Strongly disagree (%) | 13 | 9 | 10 | 18 |
| Refused/Not applicable ^a (%) | 2 | 1 | 4 | 2 |

I don't know what plant-based foods to buy.

| | U.S. Population | Annual Household Income | | |
|---|-----------------|-------------------------|-------------------|----------------|
| | | Less than \$50k | \$50k – \$99,999k | \$100k or more |
| <i>n</i> | 1,043 | 281 | 358 | 404 |
| Strongly agree (%) | 15 | 17 | 17 | 11 |
| Somewhat agree (%) | 38 | 41 | 38 | 35 |
| Somewhat disagree (%) | 24 | 22 | 24 | 27 |
| Strongly disagree (%) | 20 | 18 | 17 | 24 |
| Refused/Not applicable ^a (%) | 2 | 2 | 3 | 3 |

I don't know how to cook with plant-based foods.

| | U.S. Population | Annual Household Income | | |
|---|-----------------|-------------------------|-------------------|----------------|
| | | Less than \$50k | \$50k – \$99,999k | \$100k or more |
| <i>n</i> | 1,043 | 281 | 358 | 404 |
| Strongly agree (%) | 16 | 23 | 16 | 10 |
| Somewhat agree (%) | 31 | 34 | 31 | 29 |
| Somewhat disagree (%) | 26 | 19 | 26 | 30 |
| Strongly disagree (%) | 25 | 23 | 23 | 28 |
| Refused/Not applicable ^a (%) | 2 | 1 | 3 | 2 |

^aRespondents (U.S. population *n* = 13; Lower-income *n* = 3; Middle-income *n* = 5; Higher-income *n* = 5) who said they "never or almost never" the following meat products – beef, lamb, pork, poultry, and fish/seafood – did not receive these questions.

(Base: 1,043 Americans 18+)**How strongly do you agree or disagree with each of the following statements regarding purchasing or eating plant-based foods (fruit, vegetables, meat/dairy alternatives)? (Cont'd.)**

It's too much of an effort to buy plant-based foods.

| | U.S. Population | Annual Household Income | | |
|---|-----------------|-------------------------|-------------------|----------------|
| | | Less than \$50k | \$50k – \$99,999k | \$100k or more |
| <i>n</i> | 1,043 | 281 | 358 | 404 |
| Strongly agree (%) | 8 | 9 | 8 | 6 |
| Somewhat agree (%) | 37 | 43 | 37 | 31 |
| Somewhat disagree (%) | 32 | 29 | 30 | 36 |
| Strongly disagree (%) | 22 | 17 | 22 | 25 |
| Refused/Not applicable ^a (%) | 2 | 2 | 3 | 3 |

I don't like the taste of plant-based foods.

| | U.S. Population | Annual Household Income | | |
|---|-----------------|-------------------------|-------------------|----------------|
| | | Less than \$50k | \$50k – \$99,999k | \$100k or more |
| <i>n</i> | 1,043 | 281 | 358 | 404 |
| Strongly agree (%) | 8 | 11 | 7 | 7 |
| Somewhat agree (%) | 36 | 33 | 38 | 36 |
| Somewhat disagree (%) | 32 | 34 | 34 | 30 |
| Strongly disagree (%) | 21 | 21 | 18 | 24 |
| Refused/Not applicable ^a (%) | 2 | 2 | 3 | 3 |

It has never occurred to me to eat more plant-based foods.

| | U.S. Population | Annual Household Income | | |
|---|-----------------|-------------------------|-------------------|----------------|
| | | Less than \$50k | \$50k – \$99,999k | \$100k or more |
| <i>n</i> | 1,043 | 281 | 358 | 404 |
| Strongly agree (%) | 13 | 15 | 15 | 10 |
| Somewhat agree (%) | 31 | 36 | 33 | 24 |
| Somewhat disagree (%) | 28 | 25 | 28 | 31 |
| Strongly disagree (%) | 26 | 22 | 21 | 32 |
| Refused/Not applicable ^a (%) | 2 | 2 | 3 | 3 |

There are traditions or celebrations in my culture/heritage in which eating meat (beef, chicken, fish, etc.) plays an important role.

| | U.S. Population | Annual Household Income | | |
|---|-----------------|-------------------------|-------------------|----------------|
| | | Less than \$50k | \$50k – \$99,999k | \$100k or more |
| <i>n</i> | 1,043 | 281 | 358 | 404 |
| Strongly agree (%) | 15 | 15 | 14 | 15 |
| Somewhat agree (%) | 27 | 29 | 26 | 26 |
| Somewhat disagree (%) | 18 | 19 | 16 | 19 |
| Strongly disagree (%) | 38 | 35 | 41 | 39 |
| Refused/Not applicable ^a (%) | 2 | 2 | 3 | 2 |

^aRespondents (U.S. population $n = 13$; Lower-income $n = 3$; Middle-income $n = 5$; Higher-income $n = 5$) who said they "never or almost never" eat the following meat products – beef, lamb, pork, poultry, and fish/seafood – did not receive these questions.

(Base: 1,043 Americans 18+)**How strongly do you agree or disagree with each of the following statements regarding purchasing or eating plant-based foods (fruit, vegetables, meat/dairy alternatives)? (Cont'd.)**

I don't think it's important to eat plant-based foods.

| | U.S. Population | Annual Household Income | | |
|---|-----------------|-------------------------|-------------------|----------------|
| | | Less than \$50k | \$50k – \$99,999k | \$100k or more |
| <i>n</i> | 1,043 | 281 | 358 | 404 |
| Strongly agree (%) | 12 | 14 | 10 | 12 |
| Somewhat agree (%) | 26 | 25 | 28 | 26 |
| Somewhat disagree (%) | 34 | 36 | 33 | 33 |
| Strongly disagree (%) | 25 | 23 | 26 | 27 |
| Refused/Not applicable ^a (%) | 2 | 1 | 3 | 2 |

I don't have enough time to cook with plant-based foods.

| | U.S. Population | Annual Household Income | | |
|---|-----------------|-------------------------|-------------------|----------------|
| | | Less than \$50k | \$50k – \$99,999k | \$100k or more |
| <i>n</i> | 1,043 | 281 | 358 | 404 |
| Strongly agree (%) | 8 | 13 | 8 | 4 |
| Somewhat agree (%) | 25 | 31 | 25 | 21 |
| Somewhat disagree (%) | 39 | 33 | 42 | 41 |
| Strongly disagree (%) | 25 | 20 | 22 | 32 |
| Refused/Not applicable ^a (%) | 2 | 2 | 3 | 3 |

I don't have a grocery store/market close to where I live.

| | U.S. Population | Annual Household Income | | |
|---|-----------------|-------------------------|-------------------|----------------|
| | | Less than \$50k | \$50k – \$99,999k | \$100k or more |
| <i>n</i> | 1,043 | 281 | 358 | 404 |
| Strongly agree (%) | 4 | 6 | 4 | 3 |
| Somewhat agree (%) | 9 | 14 | 8 | 7 |
| Somewhat disagree (%) | 15 | 17 | 18 | 12 |
| Strongly disagree (%) | 69 | 62 | 68 | 77 |
| Refused/Not applicable ^a (%) | 2 | 1 | 3 | 2 |

I don't have access to fresh produce (fruit, vegetables).

| | U.S. Population | Annual Household Income | | |
|---|-----------------|-------------------------|-------------------|----------------|
| | | Less than \$50k | \$50k – \$99,999k | \$100k or more |
| <i>n</i> | 1,043 | 281 | 358 | 404 |
| Strongly agree (%) | 2 | 3 | 1 | 2 |
| Somewhat agree (%) | 7 | 11 | 5 | 5 |
| Somewhat disagree (%) | 20 | 26 | 20 | 15 |
| Strongly disagree (%) | 69 | 59 | 70 | 76 |
| Refused/Not applicable ^a (%) | 2 | 1 | 3 | 2 |

^aRespondents (U.S. population *n* = 13; Lower-income *n* = 3; Middle-income *n* = 5; Higher-income *n* = 5) who said they "never or almost never" eat the following meat products – beef, lamb, pork, poultry, and fish/seafood – did not receive these questions.

(Base: 1,043 Americans 18+)

Do you think a meal with a plant-based main course (fruit, vegetables, meat/dairy alternatives) is more expensive, less expensive, or about the same cost as a meal with a meat-based main course (beef, chicken, fish, etc.)?

| | U.S. Population | Annual Household Income | | |
|--------------------|-----------------|-------------------------|-------------------|----------------|
| | | Less than \$50k | \$50k – \$99,999k | \$100k or more |
| <i>n</i> | 1,043 | 281 | 358 | 404 |
| More expensive (%) | 49 | 53 | 52 | 42 |
| Same cost (%) | 22 | 19 | 18 | 28 |
| Less expensive (%) | 14 | 13 | 12 | 17 |
| Don't know (%) | 15 | 16 | 17 | 12 |
| Refused (%) | * | -- | -- | * |

(Base: 1,043 Americans 18+)

How willing or unwilling would you be to do the following?

| | Very willing (%) | Somewhat willing (%) | Somewhat unwilling (%) | Very unwilling (%) | Refused/Not applicable ^a (%) |
|--|------------------|----------------------|------------------------|--------------------|---|
| Eat more fruit and vegetables | 62 | 32 | 4 | 2 | * |
| Eat more plant-based meat alternatives (products made with vegetables such as soy, potatoes, peas, etc.) | 16 | 39 | 25 | 20 | * |
| Eat less red meat (beef, lamb, pork) | 19 | 36 | 22 | 19 | 5 |
| Use dairy alternatives (soy milk, almond milk, etc.) instead of dairy-based milk or cream | 16 | 29 | 25 | 25 | 5 |
| Eat less dairy (milk, cheese) | 8 | 34 | 32 | 22 | 5 |
| Eat meat that is grown from cell cultures in a laboratory rather than taken from animals | 5 | 21 | 26 | 48 | * |

^aRespondents ($n = 48$) who said they "never or almost never" eat red meat products (beef, lamb, and pork) did not receive the "eat less red meat (beef, lamb, pork)" statement. Respondents ($n = 46$) who said they "never or almost never" eat dairy products (milk, cheese) did not receive the following statements: "use dairy alternatives (soy milk, almond milk, etc.) instead of dairy-based milk or cream," and "eat less dairy (milk, cheese)."

(Base: 1,043 Americans 18+)
How likely or unlikely is it that you would eat more plant-based foods (fruit, vegetables, meat/dairy alternatives) instead of meat (beef, chicken, fish, etc.) if the following happened?

| | Very likely (%) | Somewhat likely (%) | Somewhat unlikely (%) | Very unlikely (%) | Don't know (%) | Refused/Not applicable ^a (%) |
|--|-----------------|---------------------|-----------------------|-------------------|----------------|---|
| If plant-based foods tasted better than they do today | 29 | 38 | 10 | 12 | 8 | 2 |
| If plant-based foods cost less than meat options | 33 | 30 | 13 | 15 | 7 | 2 |
| If I had better access to fresh produce (fruit, vegetables) | 32 | 30 | 15 | 14 | 6 | 2 |
| If there were more plant-based food options in stores | 25 | 36 | 14 | 16 | 7 | 2 |
| If I had more information about the environmental impact of different products and/or foods | 18 | 33 | 20 | 21 | 6 | 2 |
| If my family and friends ate more plant-based foods instead of meat | 18 | 32 | 18 | 24 | 7 | 2 |
| If someone I like and respect asked me to | 10 | 34 | 23 | 24 | 7 | 2 |
| If a celebrity or public figure (athlete, actor, singer, etc.) I like and respect asked Americans to | 3 | 10 | 20 | 58 | 8 | 2 |

^aRespondents ($n = 13$) who said they "never or almost never" eat the following meat products – beef, lamb, pork, poultry, and fish/seafood – did not receive these questions.

(Base: 1,043 Americans 18+)
How much do you think the production of the following foods contributes to global warming, if at all?

| | A lot (%) | Some (%) | A little (%) | Not at all (%) | Don't know (%) | Refused (%) |
|-------------------------------------|-----------|----------|--------------|----------------|----------------|-------------|
| Beef (steak, ground beef, etc.) | 27 | 19 | 11 | 23 | 20 | * |
| Pork (ham, bacon, sausage, etc.) | 20 | 22 | 13 | 23 | 21 | * |
| Dairy products (milk, cheese, etc.) | 17 | 23 | 14 | 23 | 23 | * |
| Poultry (chicken, turkey, etc.) | 14 | 24 | 15 | 24 | 22 | * |
| Farmed fish and seafood | 12 | 18 | 17 | 28 | 24 | * |
| Fruit and vegetables | 7 | 15 | 19 | 38 | 20 | * |
| Nuts | 7 | 15 | 17 | 37 | 24 | * |

(Base: 1,043 Americans 18+)**If everyone did the following, how much do you think it would reduce global warming, if at all?**

| | A lot (%) | Some (%) | A little (%) | Not at all (%) | Don't know (%) | Refused (%) |
|---|-----------|----------|--------------|----------------|----------------|-------------|
| Cooked over "clean cookstoves" (solar-powered, fuel-efficient, thermal-efficient) | 23 | 28 | 18 | 16 | 14 | * |
| Threw away less food | 21 | 24 | 17 | 21 | 16 | * |
| Composted food waste | 18 | 27 | 18 | 21 | 16 | * |
| Ate a more plant-based diet (fruit, vegetables, meat/dairy alternatives) | 18 | 25 | 15 | 23 | 19 | * |
| Bought food that is grown or produced locally | 17 | 29 | 16 | 21 | 17 | * |
| Bought organic food | 10 | 22 | 17 | 31 | 19 | * |

(Base: 1,043 Americans 18+)**How often do you hear about the impact of food choices on global warming in the media (TV, movies, radio, newspapers/news websites, magazines, etc.)?**

| | % |
|---------------------------|----|
| At least once a week | 13 |
| At least once a month | 16 |
| Several times a year | 16 |
| Once a year or less often | 11 |
| Never | 29 |
| Don't know | 14 |
| Refused | * |

(Base: 1,043 Americans 18+)**How often do you do the following things?**

| | Always (%) | Often (%) | Sometimes (%) | Rarely (%) | Never (%) | Refused (%) |
|--|------------|-----------|---------------|------------|-----------|-------------|
| Throw out uneaten or spoiled food because you no longer want it or it went bad | 10 | 24 | 42 | 21 | 2 | -- |
| Compost food waste | 6 | 9 | 14 | 16 | 56 | -- |
| Look for information about the environmental impact of different products and/or foods | 2 | 10 | 24 | 30 | 35 | * |
| Talk to family and friends about the environmental impact of different products and/or foods | 1 | 8 | 21 | 31 | 39 | * |
| Buy food grown or produced locally | 4 | 28 | 46 | 16 | 6 | * |

(Base: 1,043 Americans 18+)**Over the past 12 months, how many times have you done the following?**

| | Many times (6+) (%) | Several times (4-5) (%) | Sometimes (2-3) (%) | Once (%) | Never (%) | Don't know (%) | Refused (%) |
|---|---------------------|-------------------------|---------------------|----------|-----------|----------------|-------------|
| Rewarding food companies that are taking steps to reduce their impact on the environment by buying their products | 5 | 6 | 13 | 3 | 62 | 10 | * |
| Punishing food companies that are not taking steps to reduce their impact on the environment by NOT buying their products | 4 | 4 | 11 | 3 | 69 | 9 | * |

(Base: 1,043 Americans 18+)

Global Warming's Six Americas

| | % |
|------------|----|
| Alarmed | 30 |
| Concerned | 29 |
| Cautious | 15 |
| Disengaged | 4 |
| Doubtful | 11 |
| Dismissive | 12 |

Respondents were categorized based on their responses to four questions – see the Six Americas Super Short Survey (<https://climatecommunication.yale.edu/visualizations-data/sassy/>) for details on the methodology.

How willing or unwilling would you be to do the following?

Eat more fruit and vegetables.

| | Alarmed | Concerned | Cautious/Disengaged/ Doubtful/Dismissive |
|------------------------|---------|-----------|---|
| <i>n</i> | 295 | 296 | 452 |
| Very willing (%) | 78 | 61 | 51 |
| Somewhat willing (%) | 19 | 35 | 40 |
| Somewhat unwilling (%) | 2 | 4 | 5 |
| Very unwilling (%) | 1 | 1 | 5 |
| Refused (%) | * | -- | -- |

Eat less red meat (beef, lamb, pork).

| | Alarmed | Concerned | Cautious/Disengaged/ Doubtful/Dismissive |
|---|---------|-----------|---|
| <i>n</i> | 295 | 296 | 452 |
| Very willing (%) | 33 | 18 | 9 |
| Somewhat willing (%) | 32 | 43 | 33 |
| Somewhat unwilling (%) | 14 | 23 | 26 |
| Very unwilling (%) | 9 | 15 | 29 |
| Refused/Not applicable ^a (%) | 12 | 2 | 3 |

^aRespondents (Alarmed *n* = 29; Concerned *n* = 6; Cautious/Disengaged/Doubtful/Dismissive *n* = 13) who said they "never or almost never" eat red meat products (beef, lamb, and pork) did not receive this question.

Eat more plant-based meat alternatives (products made with vegetables such as soy, potatoes, peas, etc.).

| | Alarmed | Concerned | Cautious/Disengaged/ Doubtful/Dismissive |
|------------------------|---------|-----------|---|
| <i>n</i> | 295 | 296 | 452 |
| Very willing (%) | 34 | 10 | 8 |
| Somewhat willing (%) | 43 | 45 | 31 |
| Somewhat unwilling (%) | 16 | 27 | 29 |
| Very unwilling (%) | 7 | 17 | 31 |
| Refused (%) | -- | -- | * |

(Base: 1,043 Americans 18+)**How willing or unwilling would you be to do the following? (Cont'd.)**

Use dairy alternatives (soy milk, almond milk, etc.) instead of dairy-based milk or cream.

| | Alarmed | Concerned | Cautious/Disengaged/ Doubtful/Dismissive |
|---|---------|-----------|---|
| <i>n</i> | 295 | 296 | 452 |
| Very willing (%) | 26 | 16 | 9 |
| Somewhat willing (%) | 36 | 31 | 23 |
| Somewhat unwilling (%) | 20 | 30 | 24 |
| Very unwilling (%) | 12 | 19 | 39 |
| Refused/Not applicable ^a (%) | 5 | 4 | 5 |

^aRespondents (Alarmed *n* = 16; Concerned *n* = 12; Cautious/Disengaged/Doubtful/Dismissive *n* = 18) who said they "never or almost never" eat dairy products (milk, cheese) did not receive this question.

Eat less dairy (milk, cheese).

| | Alarmed | Concerned | Cautious/Disengaged/ Doubtful/Dismissive |
|---|---------|-----------|---|
| <i>n</i> | 295 | 296 | 452 |
| Very willing (%) | 13 | 7 | 5 |
| Somewhat willing (%) | 36 | 43 | 27 |
| Somewhat unwilling (%) | 31 | 32 | 32 |
| Very unwilling (%) | 15 | 15 | 32 |
| Refused/Not applicable ^a (%) | 5 | 4 | 5 |

^aRespondents (Alarmed *n* = 16; Concerned *n* = 12; Cautious/Disengaged/Doubtful/Dismissive *n* = 18) who said they "never or almost never" eat dairy products (milk, cheese) did not receive this question.

Eat meat that is grown from cell cultures in a laboratory rather than taken from animals.

| | Alarmed | Concerned | Cautious/Disengaged/ Doubtful/Dismissive |
|------------------------|---------|-----------|---|
| <i>n</i> | 295 | 296 | 452 |
| Very willing (%) | 13 | 3 | 1 |
| Somewhat willing (%) | 28 | 22 | 14 |
| Somewhat unwilling (%) | 21 | 32 | 26 |
| Very unwilling (%) | 39 | 43 | 59 |
| Refused (%) | -- | -- | * |

(Base: 1,043 Americans 18+)**How often do you do the following things?**

Look for information about the environmental impact of different products and/or foods.

| | Alarmed | Concerned | Cautious/Disengaged/ Doubtful/Dismissive |
|---------------|---------|-----------|---|
| <i>n</i> | 295 | 296 | 452 |
| Always (%) | 3 | 1 | 1 |
| Often (%) | 19 | 6 | 5 |
| Sometimes (%) | 34 | 27 | 14 |
| Rarely (%) | 27 | 36 | 29 |
| Never (%) | 16 | 30 | 51 |
| Refused (%) | -- | * | -- |

Talk to family and friends about the environmental impact of different products and/or foods.

| | Alarmed | Concerned | Cautious/Disengaged/ Doubtful/Dismissive |
|---------------|---------|-----------|---|
| <i>n</i> | 295 | 296 | 452 |
| Always (%) | 3 | 0 | 0 |
| Often (%) | 19 | 3 | 4 |
| Sometimes (%) | 34 | 21 | 11 |
| Rarely (%) | 29 | 36 | 28 |
| Never (%) | 16 | 38 | 57 |
| Refused (%) | -- | * | -- |

(Base: 1,043 Americans 18+)**Over the past 12 months, how many times have you done the following?**

Rewarded food companies that are taking steps to reduce their impact on the environment by buying their products.

| | Alarmed | Concerned | Cautious/Disengaged/ Doubtful/Dismissive |
|-------------------------|---------|-----------|---|
| <i>n</i> | 295 | 296 | 452 |
| Many times (6+) (%) | 10 | 4 | 2 |
| Several times (4-5) (%) | 12 | 5 | 3 |
| Sometimes (2-3) (%) | 23 | 12 | 7 |
| Once (%) | 7 | 2 | 2 |
| Never (%) | 37 | 65 | 78 |
| Don't know (%) | 11 | 12 | 9 |
| Refused (%) | * | * | -- |

Punished food companies that are not taking steps to reduce their impact on the environment by NOT buying their products.

| | Alarmed | Concerned | Cautious/Disengaged/ Doubtful/Dismissive |
|-------------------------|---------|-----------|---|
| <i>n</i> | 295 | 296 | 452 |
| Many times (6+) (%) | 8 | 3 | 2 |
| Several times (4-5) (%) | 9 | 2 | 1 |
| Sometimes (2-3) (%) | 22 | 6 | 6 |
| Once (%) | 4 | 3 | 2 |
| Never (%) | 44 | 76 | 83 |
| Don't know (%) | 14 | 10 | 6 |
| Refused (%) | * | -- | -- |

Appendix II: Survey Method

The data in this report are based on a nationally representative survey of 1,043 American adults, aged 18 and older. The survey was conducted December 6 – 11, 2019. All questionnaires were self-administered by respondents in a web-based environment. The survey took, on average, 10 minutes to complete.

The sample was drawn from the Ipsos (formerly GfK) KnowledgePanel[®], an online panel of members drawn using probability sampling methods. Prospective members are recruited using a combination of random digit dial and address-based sampling techniques that cover virtually all (non-institutional) resident phone numbers and addresses in the United States. Those contacted who would choose to join the panel but do not have access to the Internet are loaned computers and given Internet access so they may participate.

The sample therefore includes a representative cross-section of American adults – irrespective of whether they have Internet access, use only a cell phone, etc. Key demographic variables were weighted, post-survey, to match U.S. Census Bureau norms.

The survey instrument was designed by Matthew Ballew, Seth Rosenthal, Anthony Leiserowitz, and Jillian Semaan.

Sample details and margins of error

All samples are subject to some degree of sampling error – that is, statistical results obtained from a sample can be expected to differ somewhat from results that would be obtained if every member of the target population were interviewed. Average margins of error, at the 95% confidence level, are plus or minus 3 percentage points for the entire U.S. sample.

Rounding error

For tabulation purposes, percentage points are rounded to the nearest whole number. As a result, percentages in a given chart may total slightly higher or lower than 100%. Summed response categories (e.g., "strongly support" + "somewhat support") are rounded after sums are calculated (e.g., 25.3% + 25.3% = 50.6%, which, after rounding, would be reported as 25% + 25% = 51%).

Appendix III: Sample Demographics

| | <i>N</i> (unweighted) | % (weighted) |
|--|--------------------------|-----------------|
| Total | 1,043 | 100 |
| Men | 530 | 48 |
| Women | 513 | 52 |
| iGen (18-22) | 32 | 5 |
| Millennial (23-38) | 230 | 30 |
| Generation X (39-54) | 249 | 25 |
| Baby Boomer (55-73) | 427 | 33 |
| Silent Generation (74+) | 105 | 7 |
| Less than high school | 70 | 11 |
| High school graduate | 258 | 28 |
| Some college/Associate degree/Technical degree | 306 | 28 |
| College graduate | 237 | 20 |
| Post-graduate | 172 | 14 |
| <\$25K | 121 | 14 |
| \$25K - <\$50K | 160 | 18 |
| \$50K - <\$75K | 200 | 17 |
| \$75K - <\$100K | 158 | 14 |
| \$100K - <\$125K | 135 | 11 |
| \$125K+ | 269 | 26 |
| White, non-Hispanic | 754 | 63 |
| Black, African-American non-Hispanic | 105 | 12 |
| Hispanic | 115 | 16 |
| Other non-Hispanic | 69 | 9 |
| Northeast | 173 | 17 |
| Midwest | 248 | 21 |
| South | 391 | 38 |
| West | 231 | 24 |



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