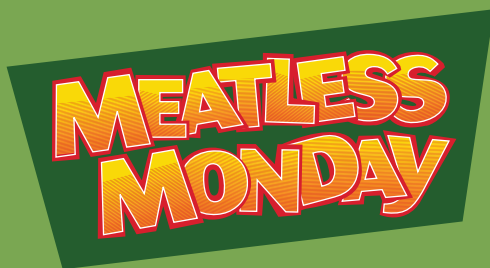


February 2019

MEAT, MENUS AND MEATLESS MONDAY



One day a week, cut out meat.



JOHNS HOPKINS
CENTER *for* A LIVABLE FUTURE

**“ONE DAY
A WEEK,
CUT OUT
MEAT”**

INTRODUCTION

“One day a week, cut out meat,” is the simple message that in 2003 sparked the growth of what became known as Meatless Monday. Now a non-profit initiative of The Monday Campaigns, Meatless Monday began in association with the Johns Hopkins Bloomberg School of Public Health with the aim of reducing the risk of preventable disease associated with diets that are high in animal products and, therefore, high in saturated fats. As more evidence emerged over the next 10 years, the message broadened to encompass the environmental and climate impacts of the meat-heavy U.S. diet. The campaign is based on the premise that Monday is the day when people are most likely to start or resume a new health behavior. Since its beginnings, Meatless Monday has grown, reaching close to 30 percent awareness among Americans, according to consumer polls. Meatless Monday participants today include individuals, restaurants, schools, hospitals, and other institutions across the U.S. and in more than 40 countries.

In this paper, we will briefly describe the rationale for reducing meat consumption as well as the available evidence about drivers and influencers of meat consumption. We will summarize what we know about the impact and reach of Meatless Monday. We will then explore behavior change literature that may add to the understanding of how campaigns such as Meatless Monday

may influence long-term meat consumption among participants. We will also identify opportunities for future research that could increase our understanding of dietary and lifestyle behavior changes associated with Meatless Monday and inform future campaign strategy.

The way in which Meatless Monday is implemented and the motivation for embracing it vary greatly across individuals and organizations. “Participation” is loosely defined and may vary according to the interpretation of what “meatless” means – whether or not it includes fish, poultry or dairy – or whether a person goes meatless every Monday or occasionally on Monday. For the purpose of this paper, we define meatless as no red meat, poultry or seafood and participation as forgoing the consumption of meat one day a week, every week.

THE RATIONALE FOR REDUCING MEAT CONSUMPTION

Globally, nearly 15 percent of greenhouse gas emissions (GHGE) are due to the production of meat, dairy and eggs (Gerber PJ 2013). A large percentage is attributable to methane emissions from ruminant animals, including cows, sheep and goats (Figure 1). Country-specific emissions related to food vary depending on trade, production methods, individual diets and other factors. Heller, et al, recently looked at the GHGE of U.S. diets in terms of what people reported eating in one day in the 2005–2010 National Health and Nutrition Examination Surveys. The researchers estimated that survey respondents’ diets emitted an average of 4.7 kg CO₂e/person/day. The people with diets in the highest quintile (top 20%), emitting >6.91 kg CO₂e/person/day, accounted for 45.5 percent of the overall estimated diet-related emissions – about eight times higher than those in the lowest quintile. In the highest impact group, 70 percent of the GHGE came from meat, whereas only 27 percent came from meat in the lowest impact group. For the total population, beef contributed 80.6 percent of the GHGE from meat, but for the highest quintile beef made up 91 percent of the GHGE from meat. The lowest impact diets were higher in vegetables, grains, and other plant-based foods and lower in meat and overall calories (Heller 2018).

U.S. consumers are eating more meat and refined grains than recommended and are not meeting requirements for fruits,

vegetables and dairy. From 1970- 2014, total protein intake increased, and although red meat (beef, pork, lamb) consumption declined slightly from its peak in 2005, poultry consumption more than doubled, nearly equaling red meat consumption (Bentley 2017, Kim H 2018). Recent analysis shows that red meat consumption may once again be on the rise in the U.S., as production levels increase and prices decrease, which are key drivers of meat consumption (Figure 2) (Sawyer 2016). In fact, analysis of the NHANES food intake data from 1999 - 2010 demonstrated that beef consumption has not significantly dropped, despite an increasing trend of more poultry and other protein

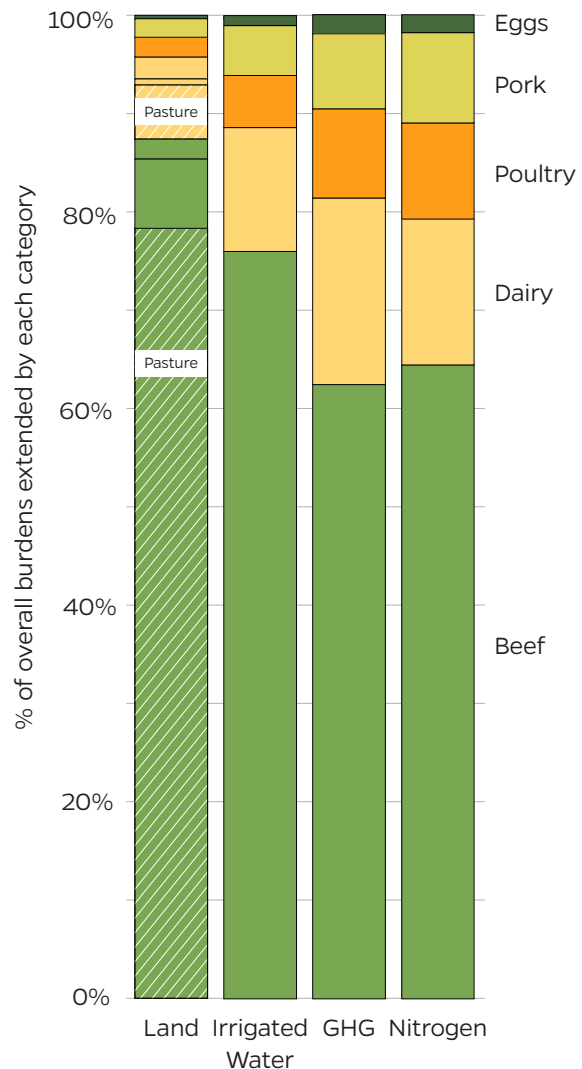


Figure 1: Percent of the overall national environmental burdens exerted by animal categories. (Eshel 2014)

sources (Kim H 2018); thus indicating a higher intake of animal protein overall. Nearly a quarter of meat consumption is processed meat, including hot dogs, bacon, sausages and deli meats) (Daniel, Cross et al. 2011). Shifting toward healthier diets with less red and processed meat, more vegetables, legumes and whole grains, would also have environmental benefits. A recent study looked at U.S. diets and concluded that healthy modifications to move them closer to the USDA Dietary Guidelines, along with recommended reductions in food waste, could decrease GHG emissions from food production 11 percent, decrease GHG emissions from landfills 20 percent, and decrease land use 32 percent, preventing further degradation and deforestation. Most of these reductions would be the result of lower intakes of meat, poultry, eggs, sugars and added fats (Birney 2017).

Shifting from high-meat diets toward plant-centric diets requires a careful and targeted approach. Meat consumption is rapidly increasing globally as incomes rise, especially in urban and wealthier communities. However, in less developed regions, food-insecure families experience higher rates of malnutrition that could be improved with adequate meat and dairy consumption and the addition of livestock for smallholder farmers (Dror 2011). Across much of the developed world, however, including North America, Europe and many parts of Asia, evidence is strong and growing that a shift toward a more sustainable, less meat-heavy diet is needed (Battaglia Richi 2015). Meatless Monday (MM) can be used to address the need to reduce meat globally and in higher meat consuming countries or communities, while recognizing that it is not appropriate in communities where undernutrition is an issue.

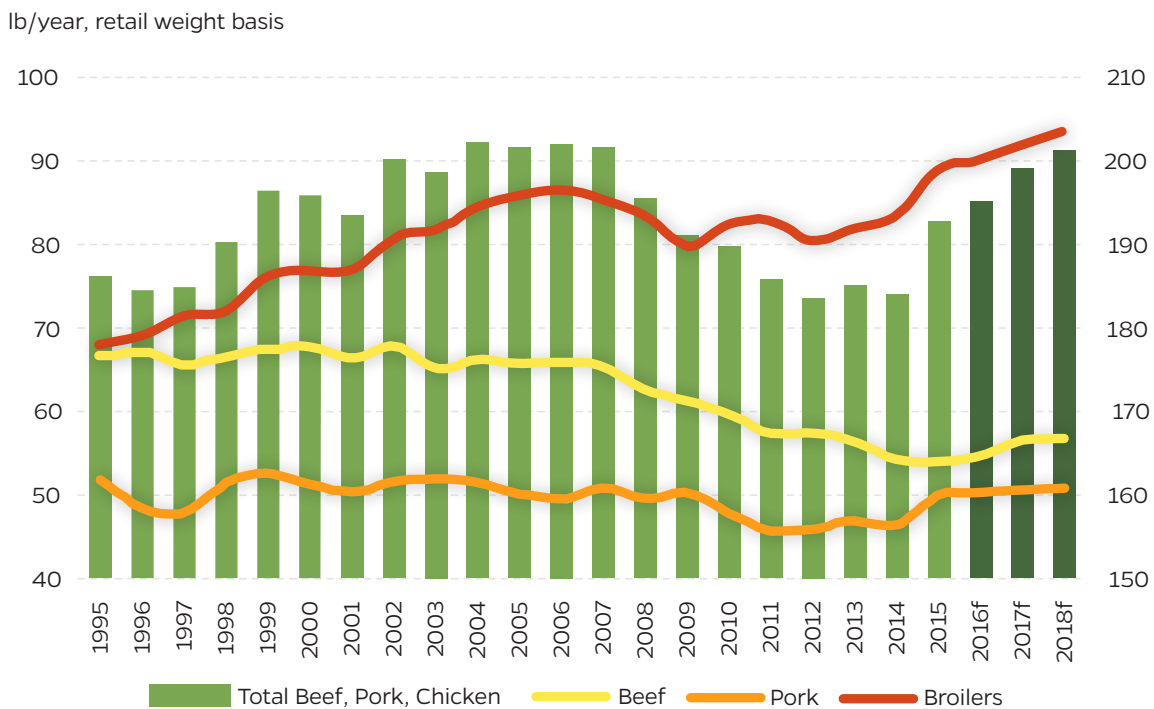


Figure 2: U.S. Per Capita Meat Consumption to Continue the Upsurge Started in 2015 (Sawyer 2016)

UNDERSTANDING THE DRIVERS AND INFLUENCERS OF MEAT CONSUMPTION AND REDUCTION

In order to understand the role and influence of Meatless Monday in the U.S., it is beneficial to understand more about meat consumption in the U.S., as well as how and why people change the amount of meat they eat.

Meat consumption in the U.S. has fluctuated over the last century; however, the last decade has seen a growing interest in diets that are lower in animal products and include more plant-based foods, often termed “flexitarian” diets (Derbyshire 2016). Changing consumer trends and a growing openness to more plant-based foods are reflected in the increasing number of menus and restaurants that feature plant-based entrees.

The National Restaurant Association’s 2018 trends survey of nearly 700 professional chefs suggests a growing customer interest in natural and hyper-local ingredients (referring to food grown, processed, and consumed at the community level), sustainability, and vegetable-centric meals (2018). Surveys conducted by the International Food Information Council (IFIC) indicate that price and taste continue to be the primary drivers of food purchasing decisions, although a small but steadily growing percentage of consumers are driven by sustainability in their food decisions, and an increasing

number of respondents reported trying to eat more healthfully by eating more fruits, vegetables, and whole grains.¹ A 2017 Mintel Survey reported that 31 percent of respondents embrace a meat-free day as a way to add more protein alternatives to their diets.²

In a 2017 Monday Campaigns consumer poll by Data Decisions Group (DDG, n=1,010), nearly 60 percent of respondents were reducing or trying to reduce the amount of meat they eat. Significantly more 25-34 year olds were intentionally reducing meat consumption, compared to older age groups (37% for ages 25-34 vs. 26.3% for 55-64 and 22.2% for 65-and-older). Similarly, significantly more 20-24 year olds (7%) do not eat meat at all, according to the survey, compared to the 25-34 (2.2%) and 35-44 (3.5%) age groups. Households with children are more likely to be actively reducing meat than households without children (38.4% vs. 27.6%). Urban residents are significantly more likely to be actively reducing meat than rural residents (36.9% vs. 26.2%). These results show that 25-34 year olds (the millennial generation) and families with children may be more open to reducing meat intake, though not necessarily completely eliminating all meat.

A USDA Economic Research Service report on purchase decisions of households revealed that among all generations, millennials (born 1981-1996) devote the smallest share of food expenditures to red meat and white meat (poultry), compared with baby boomers and traditionalists (born before 1945) (Kuhns 2017).

Research on dietary behavior change, particularly in regard to meat consumption, consistently finds that health is the most common reason consumers choose to reduce meat intake or take part in MM,

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1. [2017 Food and Health Survey: “A Healthy Perspective: Understanding American Food Values,”](#) International Food Information Council, May 2017
 2. [The Protein Report: Meat Alternatives US 2017,](#) Mintel, February 2017

followed by cost and taste.³ Sixty percent of respondents in the DDG poll had reduced meat because they were trying to eat healthier. Environmental and animal welfare concerns were less frequent influencers (2% and 5.7%, respectively). Similarly, in a 2015 Center for a Livable Future survey administered by GfK Global⁴, reasons cited for reducing meat consumption were most commonly health (52.1%) and cost (51.3%), with environment and animal welfare at 11.9% each. There is some indication that this is changing for the younger generation; in the DDG poll those ages 20-24 were significantly more likely to be motivated by environmental concerns than those over 55 (6.2% vs. 0%), though they were still much less cited than health or cost motivations for this group.

Diet and meat consumption are complex. Many published studies have looked at what drives meat consumption or influences people to change how much meat they eat. Understanding more about underlying beliefs, culture and attitudes related to meat is extremely valuable when shaping interventions aimed at making meat less prominent in the diet. Concern for animal welfare and the negative health effects of eating meat are the most prevalent reasons for abstaining from meat (i.e., vegetarianism), while those who are merely *reducing* their meat consumption most often report they are motivated by concern about negative health impacts of meat and by the desire to save money (Ruby 2012, De Backer and Hudders 2014, de Boer, Schosler et al. 2017, Neff, Edwards et al. 2018). Awareness of the environmental footprint of meat production is low and motivates only a small percentage of those attempting to eat less meat in the U.S, but this awareness is more common in some

other high-income countries (de Boer, Schosler et al. 2017, Mullee, Vermeire et al. 2017).

The most commonly reported barriers to adopting and maintaining a low-meat or meat-free diet have also been well characterized, and include: enjoyment of the taste of meat, the belief that meat is nutritionally necessary, the perception that meatless foods are inconvenient to prepare, and resistance to changing one's habits (Ruby 2012, Stoll-Kleemann and Schmidt 2016, Neff, Edwards et al. 2018). Researchers have learned that although many individuals are concerned about animal welfare, this typically does not result in people eating less meat (Graça 2016). For the most part, people have a tendency to become emotionally detached from the once-living animal associated with one's meal (Graça 2016, Stoll-Kleemann and Schmidt 2016).

Among factors external to the individual, the dietary norms in one's social network and culture can serve to either prevent or facilitate reducing meat consumption (Ruby 2012, Stoll-Kleemann and Schmidt 2016). Many justify meat eating as normal, masculine, and central to the traditional meals of their culture (Graça 2016, Stoll-Kleemann and Schmidt 2016). The availability and appeal of alternative protein foods and meatless meals has been found to be an important facilitator of maintaining vegetarianism and may be associated with attitudes toward reducing meat consumption (Ruby 2012, de Boer, Schosler et al. 2014, Hunter and Rööös 2016, de Boer and Aiking 2018). At the population level, several studies have found that news coverage of positive and negative aspects of meat influences consumption accordingly. For example, news reports of significant food safety threats correspond with a temporary dip in demand for the meat product in question, while demand for beef has increased in response to news coverage of the benefits of dietary iron (Tonsor, Mintert et al. 2010, Taylor, Klaiber et al. 2016, Shang and Tonsor 2017).

3. Monday Campaigns Awareness 2017 Study Survey Report, Data Decisions Group, October 2017

4. In 2015, Johns Hopkins worked with GfK Global (formerly Knowledge Network) to administer a survey to its Knowledge Panel, a probability-based web panel designed to be representative of the United States.

THE IMPACT AND REACH OF MEATLESS MONDAY

Shifting the meatless conversation

Regardless of why someone decides to change the amount of meat they eat, Meatless Monday provides an opportunity to introduce a wider awareness of the impact of our current food consumption patterns – particularly the influence of food production, marketing and consumption – on the environment and climate.

A recent study compared awareness of meat's climate impact and the willingness to eat less meat among American and Dutch citizens. In both countries, respondents tended to think eating less meat has little impact on minimizing climate change; however, respondents who rated the potential impact higher were more willing to eat less meat (de Boer, de Witt et al. 2016). Another study by the same authors observed that an individual's perception of the connection between nature and climate influences the way in which they accept that climate change might be mitigated by consuming meat-free meals. The meat-free meal idea was received more positively by consumers who valued "care for nature" or protecting the environment and more negatively by those who put less value on caring for nature or were skeptical about climate change. This could suggest that the meat reduction or meat-free meal idea could trigger negative responses among some consumers. The authors conclude that instead of isolating the meat-climate

issue, it is preferable to develop an approach that combines multiple values regarding food choices, including both health and nature-related values, and making a meatless meal more socially acceptable (de Boer, Schösler et al. 2013).

In 2014 and 2015, Chatham House, the Royal Institute of International Affairs, conducted online surveys across 12 countries and focus groups with respondents from low income, middle income/professionals and student groups in urban areas of four countries (U.S., UK, China and Brazil) to explore the awareness of livestock production and meat consumption as drivers of climate change and the importance of dietary changes as a mitigation strategy. Similar to other research, respondents generally recognized climate change as an important issue but were less aware of the drivers of climate change. Public awareness of livestock's role in climate change was low across all countries and all groups interviewed. Participants from the U.S. and Russia were least likely to say that livestock contributed to climate change. When presented with information linking livestock production to climate change, respondents who believed that humans were driving climate change were more open to the idea of making dietary changes as a means to reduce climate change (Bailey 2014, Wellesly 2015).

Most respondents conceded that information alone would not be enough to change their behavior, though it would prompt them to critically reflect on the issue and their diet. Among respondents already considering reducing meat consumption, the new information about the link to climate change would weigh into their intention to change behavior but would not be the primary factor. "Perhaps paradoxically, respondents in the US generally believed in the power of individual action, but they were less keen to accept their own active role in driving climate change, and by consequence their role in solving the

problem” (Wellesly 2015). In contrast, taste, preferences, price, food safety and personal health/nutrition had the greatest bearing on food choices, which matches findings from research on consumer food choices that practical concerns often take priority even among those consumers who intend to make more sustainable choices.

The Chatham House report identifies low awareness of the meat/climate connection as both an obstacle and an opportunity. “Greater awareness may cultivate a greater willingness to change” and may prompt those who are already making changes for health reasons to take further action. Greater awareness may also increase support for policy interventions at the local, state and national level. Public information campaigns to increase awareness about the role of meat in climate change were identified as a “necessary first step” in a broader strategy. Respondents suggested the issue of climate change and the relative importance of dietary changes in addressing climate change would need to be more visible in public discourse, education at all levels, media coverage, and discussions of public policy in order for most people to be motivated to change their behavior.

Meatless Monday promotes the co-benefits of shifting toward a plant-based diet, from the individual benefits of better health and lower cost of living to the external benefits to the environment, animal welfare and the climate. An individual who has already (or intends to) cut back on meat for health reasons might be more open to learning about the climate and sustainability impacts of meat consumption, and vice versa.

Approaches to promoting Meatless Monday that reach larger numbers of consumers include policies, procurement and food service. Across the food service industry, efforts have been made to reduce the size of meat portions and integrate more plant-based foods into menus of schools, hospitals, work sites, and restaurants for

sustainability and health reasons. Meatless Monday provides a customer-facing demonstration of the rationale and benefits of eating less meat. Regional and local policies that address the role of food production and consumption in climate and sustainability also have the potential to educate consumers through the promotion of Meatless Monday. Many municipalities have done this through proclamations and procurement policies for government facilities. When promoted in institutions, work sites and restaurants, meatless meals are offered as a choice and not forced upon the consumer.

Why MONDAY for Meatless?

“Meatless” is one important concept of the Meatless Monday campaign, but “Monday” is equally intentional. In the U.S. and across Western societies, the week is an important cultural pattern, and Monday is generally perceived as the official start of each week (Fry J. 2009). Monday is also often associated with greater risk of negative health events, such as heart attacks, strokes and suicides, perhaps due to stress from the start of the workweek or participation in unhealthy habits over the weekend, such as alcohol consumption, poor diets, or lack of sleep. Blood tests conducted on Monday tend to show worse results compared to other days of the week – likely due to overindulging on unhealthy food over the weekend, lending even stronger support for Monday as a day to focus on better health (Fry J. 2009).

On the brighter side, a small but increasing body of evidence supports the idea of Monday as a day of “fresh starts.” Studies show people are more engaged in web searches for health information on Monday and Tuesday (Crutzen R 2011, Ayers J 2014, Ayers JW 2014, Healey B 2014, Fuentes 2015, Gabarron E 2015). Additionally, in the 2017 DDG survey, more than half of the 1,000 adult participants viewed Monday as the day they would most likely begin a diet or exercise routine, eat healthier or even schedule a doctor’s appointment. This

suggests that early in the week people may be more open to taking steps to change their behavior.

Mondays may provide a timely opportunity to “nudge” or “prompt” those who are contemplating the idea of eating less meat to take steps to do so, such as seeking recipes and suggestions for incorporating more meatless meals into their food shopping and cooking routines. Some evidence suggests that weekly prompts, particularly those that are tailored to participants (as opposed to generic messages) can be effective at sustaining behavior change in the short term (Fry J. 2009, De Leon E 2014). However, evidence on the relative effectiveness of various delivery modes (paper, email, text, personal communications) is inconsistent and inconclusive (Fry J. 2009, De Leon E 2014, Alkhalidi G 2017).

Meatless Monday awareness and influence

In the 2017 Monday Campaigns consumer survey by Data Decisions Group (DDG), 41 percent of those familiar with Meatless Monday (n=292) stated that it influenced their decision to cut back on meat. According to the same survey urban residents are more likely to be familiar with Meatless Monday and are more likely than rural residents to have been influenced by Meatless Monday to reduce meat in their diets. Additionally, over half of those familiar with Meatless Monday noted some changes to their diet the rest of the week because of Meatless Monday, including more meatless meals at home and outside of the house, more fruits and vegetables, and less meat overall. Of all surveyed, 58.8 percent agreed that Meatless Monday helps them become more familiar with vegetarian choices (higher in ages 25-34), and 48.4 percent agreed that Meatless Monday helps them be more mindful of their food choices the rest of the week.

Challenges consumers face when practicing Meatless Monday provide equally valuable insight into how Meatless Monday

is perceived and adopted. In the aforementioned DDG survey, 33 percent of respondents agreed or strongly agreed that lack of skills or knowledge about preparing meatless meals was a barrier, with significantly more 20-44 year olds expressing agreement than those 45 or older. Friends and family preferring meat over meatless meal options was the largest barrier (68%) overall, with no significant differences consistently by age. Other barriers included belief that a healthy diet includes meat (59.3%), not enough appealing meatless meal choices when dining out (54.3%), “I don’t think I get enough protein when I don’t eat meat” (51.8%), “there are not enough appealing ready-to-serve meatless meals” (49.3%), “my family does not like [meatless meals]” (41.6%), and “meatless meals are boring” (37.5%).

Interviews with food service industry personnel revealed that the meatless message can be polarizing and negative to many people, leaving the impression that Meatless Monday was taking something away (Ramsing 2017). These observations indicate that Meatless Monday and similar campaigns need to support consumers in making changes and promote a perception that Meatless Monday is providing choices and opportunities to try new foods, rather than depriving.

How effective is Meatless Monday as defined, “one day a week, no meat,” particularly when aiming to mitigate climate change and environmental damage?

Because of the large contribution of ruminant animals to greenhouse gas emissions, a significant reduction in consumption of meat, along with changes in the energy and transport sectors, is needed to keep climate change in check. Compared to a vegan diet or even mostly vegan diet, a meatless day once a week is likely to have a minimal impact on greenhouse gas emissions. On a per capita basis, eliminating all meat one day a week from the typical U.S. dietary pattern

Reduction in diet-related GHG footprints of U.S. population dietary shifts

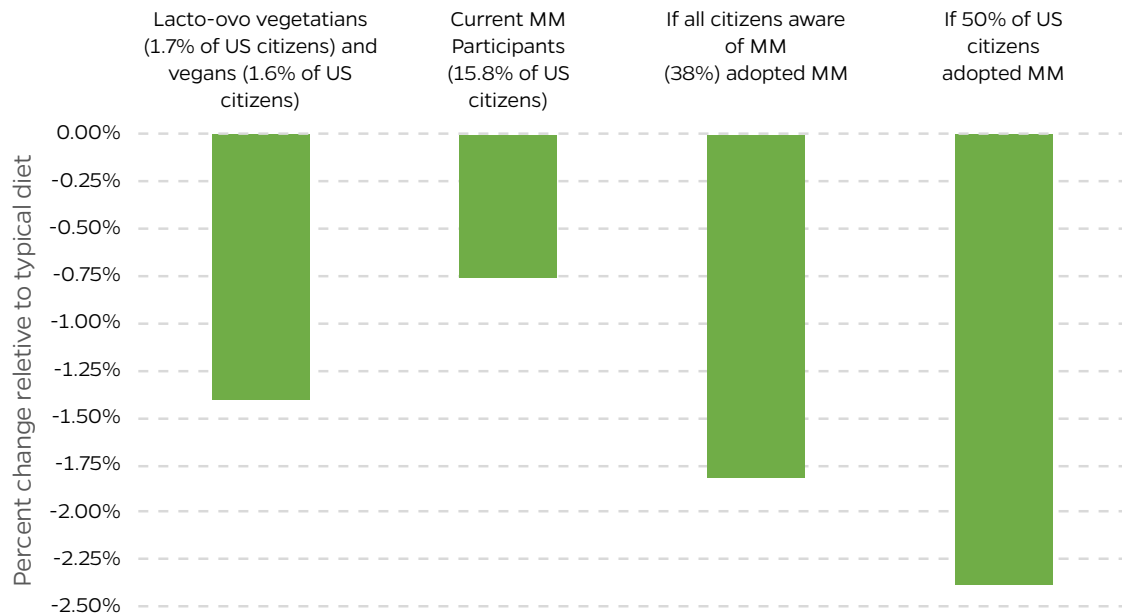


Figure 3: Reduction in diet-related GHG footprints of U.S. population dietary shifts
 Current vegan (1.6%) and vegetarian (additional 1.7%) population estimates from Vegetarian Resource Group Harris Poll (2016). Current Meatless Monday participation (15.8%) awareness (38%) from the Monday Campaigns DDG Poll (2017)

could decrease an individual’s diet-related GHG footprint by an estimated 4.8 percent (Heller and Keoleian 2015). In contrast, eating a lacto-ovo vegetarian diet (no meat but including dairy and eggs) could cut one’s individual diet-related GHG footprint by 33 percent, and a completely vegan diet (no animal products) by 53 percent (Heller and Keoleian 2015). These estimates are based on a 2000 calorie diet; since most US citizens consume over 2000 calories (average intake of 2475 for men, 1825 for women)⁵, the potential GHG reductions from adopting plant-centric diets are likely greater.

Yet, while the climate impact of Meatless Monday may not reach the magnitude of a lacto-ovo vegetarian or vegan diet on an individual level, the potential impact of many people practicing Meatless Monday by not eating meat one day each week should not be overlooked. Given what we know about

behavior change, the likelihood of more people making small reductions in meat consumption is greater than the likelihood of a large percent of the U.S. population switching to vegan or even vegetarian diets. For example, if the 38 percent of the U.S. population who according to surveys are aware of Meatless Monday practiced it weekly for a year, the reduction in diet-related GHG emissions would be equivalent to taking over 1.6 million cars off the road for a year or recycling 2.7 million tons of waste instead of discarding it in landfills (Figure 3). This reduction is also greater than the projected impact of the dietary habits of all current vegans and vegetarians in the U.S. These reductions are not insignificant, especially when combined with other diet changes, more efficient production, and improvements in the energy and transportation sectors.

Research shows that small incremental changes are more likely to lead to lasting behavior changes than sudden changes (Lutes 2008, Lewis 2016). In the 2015 GfK survey, of those who ate less meat (red meat, poultry, seafood) over the previous

5. National Health and Nutrition Examination Survey 2013-14; NATIONAL CENTER FOR HEALTH STATISTICS Fact Sheet, March 2017; https://www.cdc.gov/nchs/data/factsheets/factsheet_nutrition.pdf

year (689 out of 1,112), 31.8 percent ate less by cutting meat out of their diet one day a week, 42.5 percent by eliminating it from at least one meal, 65.7 percent by buying less, 55.6 percent by eating smaller portions, and only 8.1 percent by cutting it out completely. These results confirm that people are more receptive to smaller changes than to eliminating meat entirely.

Moreover, even with growing interest in eating more plant-based foods, the number of vegetarians/vegans in the U.S. remains low. According to a 2018 Gallup Poll, five percent of Americans identify as vegetarians and three percent as vegans (likely includes overlap, as these questions were asked separately, thus some vegans may have also identified as being vegetarian)(Reinhart 2018). Another survey by Faunalytics reported that 1.5 percent were current vegetarians and a mere 0.5 percent current vegans. The survey also revealed that there are more than five times as many former vegetarians/vegans as there are current vegetarians/vegans, and 53 percent of vegetarians/vegans abandon their diet in under a year (Asher 2014a, Asher 2014b). Thus, we can assume there is a very low likelihood that the number of vegans will increase to a magnitude that would have a significant impact on GHGE.

In the same survey, vegetarians who had been able to maintain their diet long term (most greater than 10 years) were less likely to have transitioned over a short period of time, like a few days or weeks (Asher 2014a). Likewise, former vegetarians/vegans in the survey population were more likely to have transitioned abruptly to a vegetarian diet (Asher 2014b). These findings suggest that people who transition more slowly over time to a vegetarian/vegan diet are more likely to adhere to it long term. Additionally, having multiple reasons for being vegetarian or vegan was associated with maintaining the diet for the long term.

More recent findings from the same group of researchers show that a message

focused on reduction of animal products (as opposed to abstention) may be most effective in creating an overall decline in animal product consumption. The report suggested that, given that 43 percent of lapsed vegetarians/vegans say they found it too difficult to maintain a “pure” diet, advocates may want to develop appropriate strategies in response, emphasizing reduction over strict avoidance. Furthermore, lapsed vegetarians/vegans eat less meat than the U.S. average (Asher 2014a). The average former vegetarian/vegan may be more appropriately thought of as a meat reducer or possibly even a semi-vegetarian (flexitarian), given that on average they eat only slightly more than half the daily servings of meat compared to the U.S. population in general.

Not to be overlooked is Meatless Monday’s impact on health. Studies show that smaller changes can have significant health benefits. In a European Journal of Clinical Nutrition study, replacing only one percent of calories from animal protein with energy from plant protein was associated with an 18 percent decrease in risk of Type 2 Diabetes (Hosseinpour-Niazi, Mirmiran et al. 2014). This association remained after adjusting for BMI. One study reported that a three percent increase in daily calories from plant protein was found to reduce risk of death by 10 percent and risk of dying from heart disease by 12 percent (Song, Fung et al. 2016). Similarly, only 50 grams per day of processed meat could increase the risk of developing diabetes by 19 percent and heart disease by 42 percent (Micha, Wallace et al. 2010).

Meatless Monday’s greatest contribution may be helping individuals and communities take the first step toward meat reduction and gradual diet changes that are healthier and more planet friendly.

EXPLORING BEHAVIOR CHANGE THEORIES TO PREDICT LONG-TERM IMPACT OF MEATLESS MONDAY

Are people more likely to abstain from meat more than one day a week if they practice Meatless Monday?

Many interventions and behavior change models have been studied to understand what drives long-term behavior change, particularly eating behavior. A review of behavior models and similar interventions provides insight into how Meatless Monday may or may not spark changes beyond skipping meat one day a week. Understanding how behavior change happens in the current environment of social media and technology is vital to (1) hypothesizing whether MM is making an impact beyond Mondays and (2) designing a campaign that is more likely to lead to more impactful dietary changes. We describe a few potentially relevant models below.

Prompts

Behavior change interventions that include regular prompts are thought to increase compliance and consistency, and to an extent Meatless Monday's built-in weekly reminder can be viewed as such a prompt. Fry and Neff (2009) reviewed literature assessing the use of prompts in weight loss,

physical activity, and diet interventions. They found that periodic messaging had a positive effect, but without individualized counseling or personalized messages the effect appeared to wane over time.

A literature review on impacts of periodic prompts for healthy behaviors found that in most cases, prompts resulted in significant positive behavioral outcomes for participants, especially when feedback and provision of specific strategies were included (Fuentes 2015). In the case of Meatless Monday, the Monday prompt is used to encourage new or continued diet change but only for Monday. Given that Meatless Monday's "ask" is only for changes on Monday – unlike interventions that encourage daily dietary changes or physical activity throughout the week – it may need a modified model or approach to sustain or extend its influence.

Integrated Gateway Model

Long-term behavior change may also be approached by assessing whether there is a so-called gateway behavior that correlates with subsequent desired behaviors. The Integrated Gateway Model describes how specific behaviors either precede or are associated with a cascade of downstream positive outcomes. In a recent study of maternal health behaviors in Nigeria, spousal communication about family planning was associated not only with the use of contraceptives but also with behaviors such as handwashing, early initiation of breastfeeding, and undergoing HIV testing. Some of the resulting behaviors were directly related to the original gateway behavior, whereas others seemed unrelated. Interpersonal communications within social networks were important mediators overall (Schwandt, Skinner et al. 2015).

In the case of Meatless Monday, it would be valuable to study whether not eating meat on Monday precedes further meat reduction the rest of the week, as well as what factors influence meat-eating behaviors, such as relationships and communication. With regard to the study of Dutch and Amer-

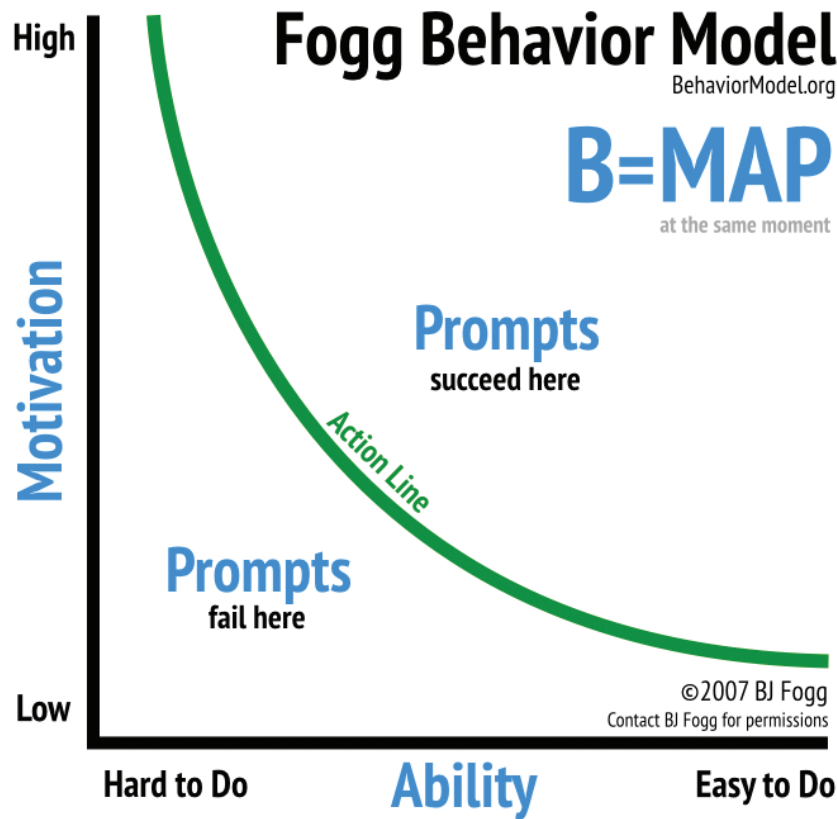


Figure 4: Fogg Behavior Model (Used with permission from: BJ Fogg, behaviormodel.org)

ican consumers mentioned earlier, developing a more keen awareness and appreciation of nature would enhance an individual’s openness to meat reduction as a way to protect the environment. The Audubon Society uses this approach of concern for birds to introduce and invite people to engage on broader environmental issues, including climate change.

Fogg’s Behavior Model and persuasive design

Another potentially useful perspective is Fogg Behavior Model, which describes how persuasive design must address motivation, ability, and the prompt (Figure 4). The right prompt or trigger can spark motivation, facilitate an action, or simply serve as a reminder or cue to that action. In the case of Meatless Monday, prompts would work as a cue only when the motivation and ability already exist. In cases where motivation or ability is low, the prompt would need to spark or facilitate the desired behavior in order to be

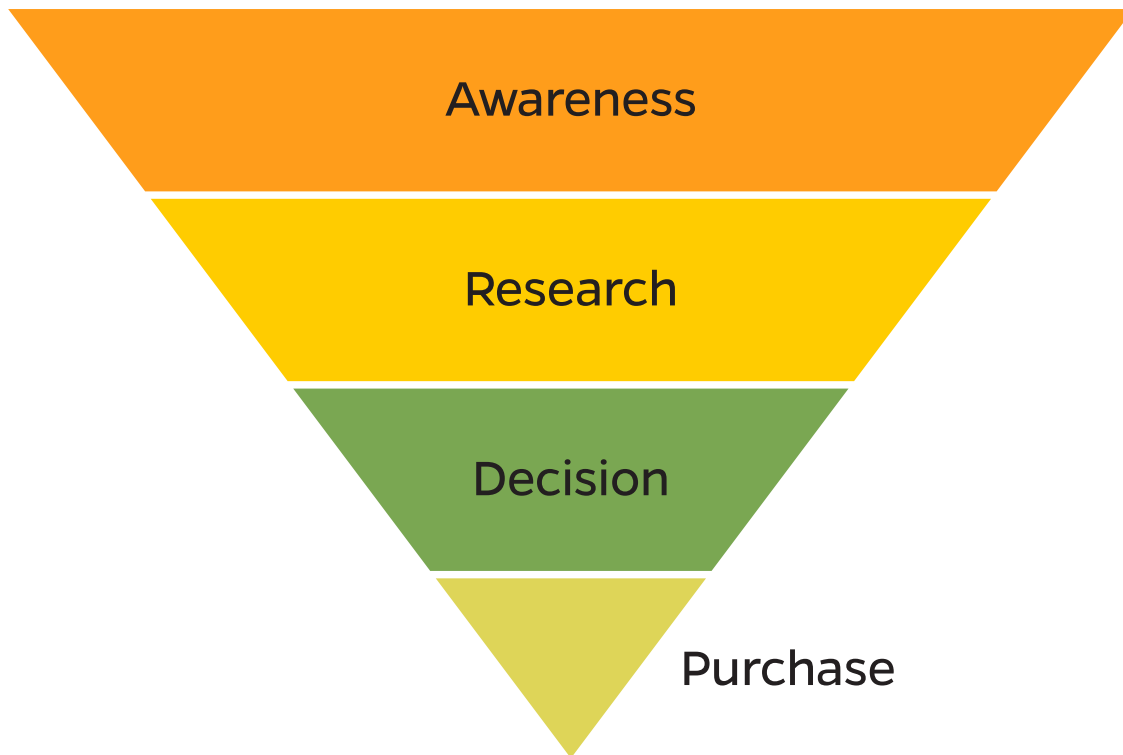


Figure 5: The Buying Funnel (Adapted from: Jansen 2011)

effective. When motivations are low and the action is hard, practicing small, easy habits leads to desired outcomes. Therefore, if a person desires to eat less meat and more vegetables, Mondays can be a prompt for developing a small habit that can eventually lead to long-lasting diet changes. The key is understanding the consumer's motivation and ability, then adapting the Meatless Monday message accordingly. This model is a good approach for "middle of the roaders," who are open to change but have not yet acted on it.

The Buying Funnel

Finally, the buying funnel, or purchase funnel, is a model frequently used in marketing to explain the stages a consumer moves through en route to an eventual purchase or similar conversion behavior (Figure 5). Beginning with awareness that a product exists and meets a need, consumers move through a research stage, in which they investigate existing marketplace options; a decision or brand selection stage; and finally, the purchase stage (Jansen 2011).

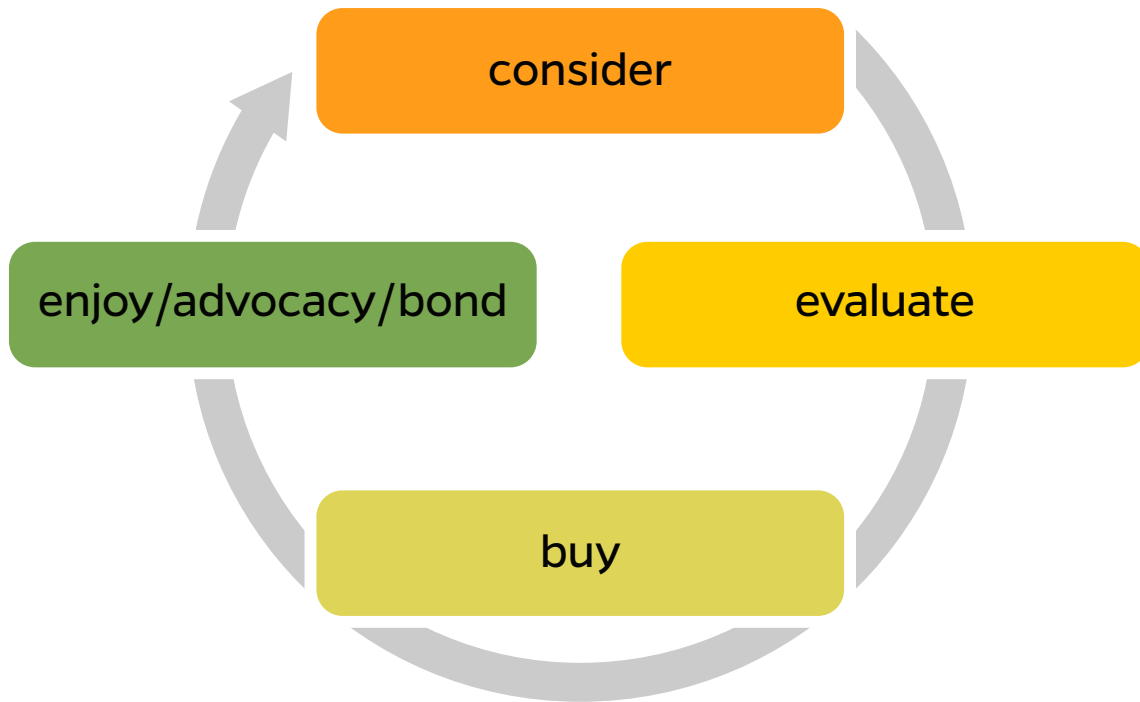


Figure 6: The Buying Funnel with interactive stages (Adapted from: Edelman 2010)

While its original application was in the for-profit marketing sector, the purchase funnel has been adapted for other settings, and used to explain people’s behavior in a variety of contexts. Recently, the funnel was successfully used to increase recruitment for an online health research study, and it has also been applied to awareness and consumer behavior around seafood consumption (Wright 2015, Doshi 2017).

Since its conceptualization, the original model has shifted from a top-down hierarchical approach to a more interactive process such as these stages: consider, evalu-

ate, buy, and enjoy/advocate/bond (Figure 6) (Edelman 2010, Achrol 2012). It has been suggested that in the Web 2.0 era customers no longer make decisions in a linear manner, and that successful brands or campaigns are those that are able to facilitate and engage in conversations, especially around the experiences of individual consumers (Powers 2012). A “loyalty loop” (Figure 7) may also exist, in which a customer moves from the consideration stage to the buying phase via ongoing exposure to the product (Elzinga 2009). This underscores the importance of the post-purchase enjoy/advocate/bond

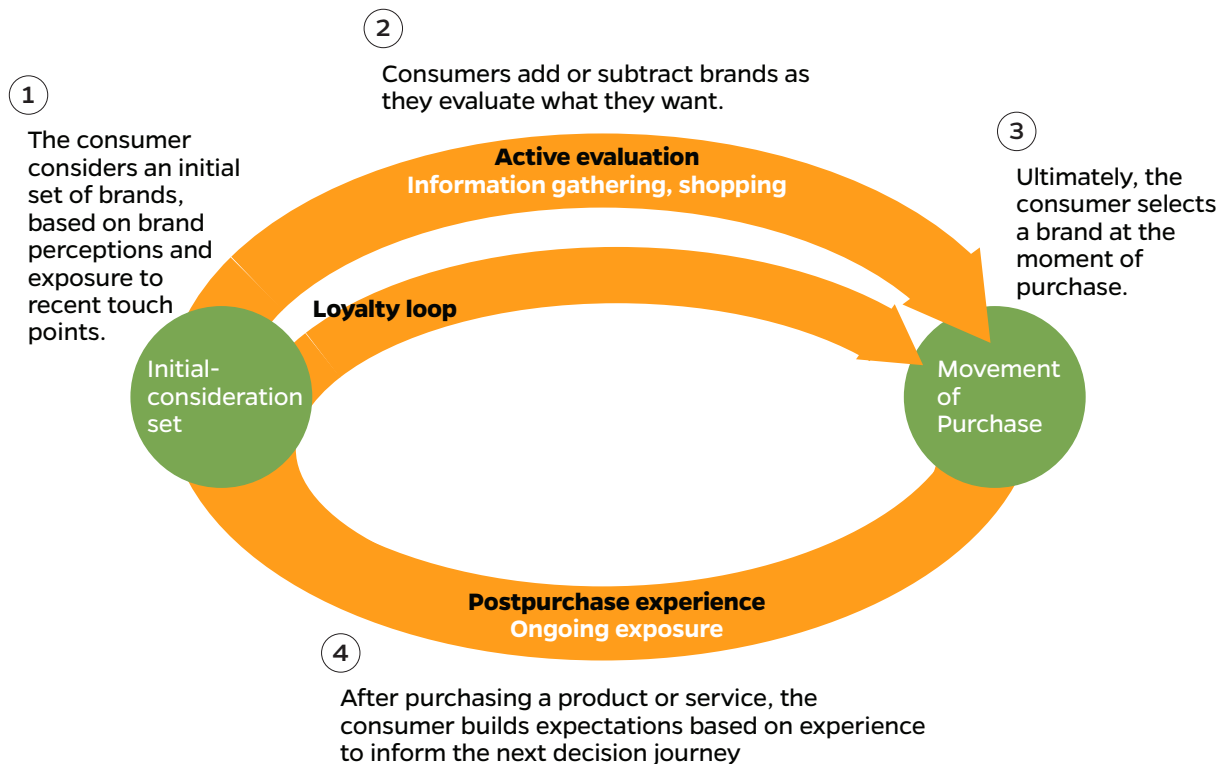


Figure 7: The Buying Funnel Loyalty Loop (Adapted from: Elzinga 2009)

stage, and emphasizes how resources deployed by a brand in this stage can lead customers to experience an increased connection with the brand – in this case, Meatless Monday.

This body of behavior change research has many implications for the Meatless Monday campaign. Incorporating more conversation and interaction with the Meatless Monday audience tailored to the purchase funnel stages acknowledges the individual’s or organization’s role in driving Meatless Monday actions. Engaging audiences by providing tools and a platform through which

customers can act as advocates builds loyal followers and promoters of Meatless Monday. Adapting content and optimizing media channels for the customer provokes dialogue and makes sharing simple and appealing. These concepts can be leveraged to extend the impact of MM on consumers’ long-term eating habits.

OPPORTUNITIES FOR FUTURE RESEARCH

What gaps remain and how might we learn more?

In order to confidently promote MM as a campaign that benefits the climate, sustainability and public health, it is important to more thoroughly assess the longer term impact of Meatless Monday on meat consumption and even other behaviors. Many questions remain:

- What makes an individual receptive to the message of Meatless Monday? How does this vary geographically and among different demographic groups? We have limited knowledge about what initially attracts a person to the Meatless Monday campaign, or what motivates a person to try the highlighted Meatless Monday item in the cafeteria line or go to the web site to find and try a recipe. Understanding more about what makes individuals open to these first steps could make Meatless Monday more effective at encouraging further steps toward reducing meat consumption. This would also provide insight on how to adapt the Meatless Monday message for new audiences or communities.
- How does an individual or family typically embrace Meatless Monday? Studying people who have participated in Meatless Monday for more than a year could provide further understanding of the level of adherence to Meatless Monday among different demographic groups. Once we understand more about groups who participate in Meatless Monday and their adherence to the concept, we can tailor promotional and educational messages to align with successful behavior change models.
- How does Meatless Monday influence participants' diets on other days of the week? We don't know if those who try Meatless Monday continue the practice long

term and are consistent from week to week – or whether adopting Meatless Monday leads them to eat more meatless meals on other days of the week. Or even if it causes them to eat more meat the rest of the week.

- Should Meatless Monday ask participants to consider further reducing meat, or could there be a separate program or campaign that addresses this “next step”?

Future research recommendations

1. Perform a market segment analysis of customers to better understand pathways to meat reduction, including vegetarianism and veganism (perhaps via collaboration with existing food-related research).
2. Survey individuals who have committed to Meatless Monday through a pledge or group, such as a Meatless Monday listserv, to better understand why they committed to Meatless Monday, their adherence, and other changes they have made as a result of Meatless Monday.
3. Conduct targeted research to assess the demographic groups and settings where Meatless Monday has the greatest chance for successful expansion.
 - a. Use focus groups to study what makes people willing to make changes.
 - b. Implement a study that would place individuals on Meatless Monday, typical and vegan diet patterns to assess differences in outcomes, such as adherence, diet changes, and associated environmental impact. Include recommendations garnered from behavioral change research literature in implementation.
 - c. Compare food service sites that are using different approaches to meat reduction. Assess outcomes such as customer food choice and satisfaction, changes in procurement practices, and impacts on profit.

SUMMARY

As a concept, Meatless Monday has endured for decades, stretching from wartime conservation efforts in the early 1900s to the Meatless Monday campaign initiated in 2003 to encourage individuals to reduce their saturated fat intake. It has since evolved into a movement that simultaneously can improve human health, the environment, climate, and animal welfare with one simple message, “One day a week, cut out meat.”

Meat consumption in the U.S. and globally must be significantly reduced to mitigate the public health and environmental effects of climate change, particularly in high-income countries. Eating less meat would also reduce the burden of chronic diseases in the U.S. and other high-income countries. Although meat consumption remains high in the U.S., there is a recent and growing interest in plant-based foods among consumers.

Meatless Monday endeavors to bring awareness to the importance of reducing meat for individual and planetary health and provide a simple, easy step toward making the change. Recognizing who is more receptive to the meat reduction message and more likely to be exposed to the Meatless Monday campaign increases the likelihood of campaign success. Surveys indicate that younger, urban consumers, especially those who have families, are more aware of Meatless Monday and likely to be reducing meat consumption. Older generations and rural residents are less aware of Meatless Monday and less likely to reduce meat consumption. Moreover, the growing interest in plant-based meat alternatives in the U.S. appears to be centered primarily in younger, urban populations. The culinary sector could drive food trends by introducing new foods and flavors that highlight plant proteins, and by offering smaller portions of meat. Other opportunities include policy, media, and educational outreach.

When considering strategies such as Meatless Monday, it is also important to better understand why people may or may not desire to change the amount of meat they consume. There are many internal and external factors to consider, including health, knowledge, taste preferences, culture, the food environment and the availability/acceptability of alternative protein foods. Research shows that consumers who are more environmentally focused are typically more receptive to accepting the connection between animal product consumption and climate change and willing to reduce the amount of meat they consume. On the other hand, those who are more politically conservative tend to be less willing to reduce meat consumption for environmental reasons (though they may for the sake of health benefits).

Health concerns remain a strong driver of both meat consumption and reductions and could potentially be exploited to build awareness of other consequences of high-meat diets, as well as to focus on the benefits of nutrient-dense plant foods, such as vegetables, whole grains and legumes. Meatless Monday can appeal to different consumers for different reasons. It approaches meat reduction by targeting various motives and aims to align with knowledge, beliefs, and motivations of diverse groups.

Knowing that long-term meat reduction by many individuals and on more days throughout the week is ultimately needed to mitigate climate and environmental risks, behavioral change research helps us to ascertain measures that may increase the likelihood that an individual or group takes up an initial action such as Meatless Monday and then continues to reduce meat consumption beyond Monday. In most cases, people do not change behaviors quickly, nor dramatically. Meatless Monday as a prompt or nudge can be useful especially when interactive feedback with the consumer is built in. Incorporating more conversation and interaction

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with the Meatless Monday campaign could build loyal followers and provide opportunities to encourage meat reduction beyond one day a week. Finally, understanding different audiences' receptiveness and readiness can help those promoting Meatless Monday to leverage it as a trigger, a motivator or an enabler, depending on the audience.

The Meatless Monday campaign offers an opportunity to attract greater participation through its broad reach. The campaign can also become a catalyst for significant dietary shifts, such as meat reduction on other days of the week and shifts in the type of meat and animal-source foods that are produced and consumed. Meatless Monday can be a step toward more impactful, long-term change that contributes to planetary and personal health.

From the beginning, the Center for a Livable Future at Johns Hopkins Bloomberg School of Public Health has served as scientific advisor to the Meatless Monday campaign. The Center harnesses expertise from throughout Johns Hopkins University to conduct activities that contribute to the scientific foundation of the campaign. This includes a range of work that builds upon the Center's comparative strengths as an interdisciplinary academic center within a school of public health, and includes: research projects, literature reviews, communication and science translation activities, educational programming, as well as outreach activities that engage selected public health and nutrition science communities. Today, Meatless Monday is part of [The Monday Campaigns](#), which produce public health initiatives in association with Johns Hopkins, Columbia and Syracuse Universities, based on the premise that each Monday provides a fresh start to begin healthy new behaviors – or get back on track with earlier good habits.

Beyond individuals, Meatless Monday has been taken up by a broad swath of organizations with diverse interests and missions. Hospitals, health bloggers and restaurants promote the health benefits of Meatless Monday, while environmental groups and food service institutions embrace the sustainability benefits of eating less meat. Animal welfare advocates support the humane benefits of lowering the demand for meat. More recently, cities and governments are embracing Meatless Monday as a way to mitigate climate change. New York City, for example, implemented Meatless Monday in 15 schools and in the Mayor's own house.

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