

REVIEW



Plant power: SEEDing our future with plant-based eating

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Abstract

The climate crisis, coupled with the COVID-19 pandemic and the Black Lives Matter movement, are contributing to a shift in what people eat. For environmental sustainability, ethical, social justice, and health reasons, people are embracing plant-based diets, which involve consuming mostly fruits, vegetables, grains, and beans and little or no meat and dairy products. Drawing on insights from consumer psychology, this review synthesizes academic research at the intersection of food and consumer values to propose a framework for understanding how and why these values—Sustainability, Ethics, Equity, and Dining for health—are transforming what people eat. We term our model the **SEED** framework. We build this framework around a report assembled by the Rockefeller Foundation (2021) that describes how to grow a value-based societal food system. Finally, we highlight insights from consumer psychology that promote an understanding of how consumer values are shifting people's diets and raise research questions to encourage more consumer psychologists to investigate how and why values influence what consumers eat, which in turn impacts the well-being of people, our environment, and society.

KEYWORDS

climate crisis, equity, ethics, food, health, social justice, sustainability

INTRODUCTION

To promote environmental sustainability and social justice, and for ethical and health-related reasons, more people are eating plant-based diets than ever before (Rao, 2021). Plant-based eating involves consuming fruits and vegetables as well as nuts, grains, and beans while eating few, if any, meat and dairy products (McManus, 2021). Driven by their social values, people under the age of thirty-five are leading this movement toward plant-based eating (Monahan, 2020b). After marching in a climate strike in Ottawa in September 2019, seventeen-year-old Mia Kelly reflected, “Climate change was really on my mind a lot. And then I realized that switching to a vegetarian or vegan diet was the biggest thing I could do as an individual” (Monahan, 2020a). Thirteen-year-old Josie

DeBellis of Washington, DC, who has eaten a meatless and dairy-free diet for 5 years noted, “It's really the best thing you can do to help animals and save the climate” (Monahan, 2020b). Celebrated Michelin Star restaurants are following suit with plant-based dining. Chef Daniel Humm of the three-Michelin Star restaurant, Eleven Madison Park, reopened his restaurant after its COVID pandemic closure with a plant-based menu devoid of meat and seafood due to concerns about food system sustainability (Bryant, 2022).

Food industry executive Mary McGovern acknowledged people's growing interest in plant-based eating noting, “I've been in the food industry for 30 years, and I've not seen anything like the tectonic change we're seeing in the market now” (Creswell, 2021). It is important to note that those who follow a plant-based diet often

do not identify or label themselves as vegetarians or vegans, groups that account for 3% of Americans (or approximately 9.7 million people up from 290,000 in 2004; Danziger, 2020). The shift to plant-based eating reflects a bevy of consumer values: Consumers concerned about climate change and sustainability report that they are eating little or no meat after learning that 14.5% of greenhouse gas emissions can be attributed to animal agriculture (Harris, 2021). After viewing social media videos and documentaries on factory farming and the treatment of animals, ethically minded consumers concerned with animal welfare are doing the same (Bryant, 2022; Gummerus et al., 2017). Health concerns are directing more consumers to reduce meat consumption, which is linked to increased risk for coronary heart diseases, and eat more plants (University of Oxford, 2021). In fact, 60% of Americans report that health concerns related to COVID-19 have prompted them to eat more plant-based foods since the beginning of the pandemic (Chiorando, 2020; Solway, 2021).

This choice to move toward a plant-based diet is not available to all consumers. Inequity in healthy food access is a barrier to plant-based eating. In the United States as well as other places worldwide, the COVID-19 pandemic and the Black Lives Matter Movement revealed the significant health disparities associated with inequality in food access (Bosman et al., 2021). The Black Lives Matter Movement has highlighted the urgent need to address the long-standing inequity in many Black and Latinx communities and tribal nations that limits community access to the fresh fruits and vegetables essential to a plant-based diet; this has led to higher rates of preexisting health conditions that, in turn, worsened the impact of COVID-19. As a result, Black, Latinx, and Native Americans are bearing a disproportionately greater share of COVID-19 deaths relative to white and Asian Americans (Bosman et al., 2021). According to food writer and activist, Tracye McQuirter, author of *By Any Greens Necessary*, “While the root cause is systemic white supremacy, one of the symptoms is we have access to the unhealthiest foods” (BBC, 2020). Darrius Mozaffarian, Dean of Tufts University's School of Nutrition Science and Policy, notes, “We're at a tipping point. People widely recognize that the food system is broken” (Reiley, 2021).

We apply a consumer psychology lens to synthesize academic research at the intersection of food and four consumer values: (1) sustainability, (2) ethics (i.e., animal welfare), (3) equity (i.e. equitable food access for all), and (4) health to propose a framework for understanding how these values are transforming—and have growing potential to further transform—the way more people eat. Our review focuses on offering a framework to support consumers as they live these values. A search of the *Journal of Consumer Psychology* for articles at the intersection of food, sustainability, health, and social justice and ethical concerns reveals more than one hundred articles in the

last twenty years that touch on these domains, with an increasing number of such articles published in the last five years (e.g., Catlin et al., 2021; Chernev & Blair, 2021; Florack et al., 2021; Grier et al., 2022; Kim & Yoon, 2021; Li et al., 2022; Nardini et al., 2021; Raghunathan & Chandrasekaran, 2021; Salerno & Sevilla, 2019; Simonson, 2020; Zane et al., 2016). We build our review on the foundation established by this extant research and related articles in marketing, nutrition, sustainability, social justice, and ethics.

More specifically, we draw from a recent report issued by the Rockefeller Foundation (2021) which focuses on understanding how the US food system impacts people's lives from its effects on rising healthcare costs to climate change. This report investigates the true cost of food by examining the societal impact of our current food system. It also explores how to build a food system that supplies healthy and affordable food to all people. According to Rajiv Shah, president of the Rockefeller Foundation, “This report is a wake-up call. The U.S. food system as it stands is adversely affecting our environment, our health and our society ... The data in this report reveals not only the negative impacts of the American food system but also what steps we can take to make it more equitable, resilient and nourishing” (Reiley, 2021). The Rockefeller Foundation report focuses on the food supply and invites organizations and institutions to adopt its recommendations, an important step toward changing our food system. Our review builds on the tenets of the Rockefeller report but focuses on how consumer decisions are also a vital component of transforming the broader food system as individual consumption decisions have a collective impact. We explore how and why the values identified in the Rockefeller Foundation report—in particular, concerns about sustainability, ethics, equity, and health—influence what consumers eat. In addition, in keeping with the global nature of research in consumer psychology, we work to extend our lens beyond the United States to include consumers across the globe.

We begin this review by briefly introducing research in consumer psychology focused on food. Next, we present our framework for understanding and characterizing value-focused eating which is propelling consumers toward a plant-based diet. This framework integrates relevant concepts from consumer psychology and its associated disciplines into an adaptation of the Rockefeller Foundation's (2021) supply chain-focused model to provide a consumer perspective on how and why values can impact consumers' food consumption. Our framework explores four critical values identified in the Rockefeller report—Sustainability, Ethics, Equity, and Dining for health—that influence what consumers eat and do not to eat. We call this the **SEED** framework for value-based eating. Finally, we highlight the contributions and generative potential of this work as it relates to academic research and individual, environmental, and societal well-being. We identify opportunities where we, as

consumer psychologists, can contribute research to further the understanding of how and why values influence what consumers eat.

FOOD AND FOOD WELL-BEING

The literature on food and food well-being in consumer psychology and marketing is expansive (Biswas et al., 2021; Block et al., 2011; Dallas et al., 2019; Hildebrand et al., 2021; Kim & Yoon, 2021; Li et al., 2022; Raghunathan & Chandrasekaran, 2021; Schlosser, 2015; Scott & Vallen, 2019; Sinha, 2016; Taylor & Noseworthy, 2021; Woolley & Fishbach, 2017; Ye et al., 2020). Several prior reviews have offered integrated perspectives of this literature (Andrews et al., 2017; Bublitz et al., 2010; Wansink & Chandon, 2014). For example, in their review, Bublitz et al. (2010) examine the factors that enable, as well as disrupt, consumers' efforts to exercise restraint with respect to the goal of eating less. In *Slim by Design*, Wansink and Chandon (2014) bring together consumer psychology research that examines how to leverage automatic influences on food decisions to help consumers, organizations, and policy makers combat the health problems associated with the overconsumption of food. Finally, Andrews et al. (2017) explore the cognitive processes and nutrition knowledge consumers use to evaluate and choose which foods to eat with the goal of empowering consumers to make more informed food choices. These reviews of the consumer psychology food literature, which are focused on how food choices contribute to or undermine health, are complemented by research innovating and exploring the food well-being paradigm (Block et al., 2011; Scott & Vallen, 2019). Indeed, insight into food well-being, "a positive psychological, physical, emotional, and social relationship with food," has pivoted research in consumer psychology and marketing beyond the examination of overconsumption and food restriction to "a more positive, holistic understanding of the role of food in a person's overall well-being" (Block et al., 2011, p. 5). In this review, we adopt this broad food well-being perspective as we explore consumer psychology research to illuminate value-based eating and its impact on consumer, environmental, and societal well-being.

It should be noted that consumer psychology research studies often employ food stimuli and decisions because they offer a convenient method to investigate how psychological phenomenon influences consumer attitudes, choices, and behavior. However, our central focus is not on consumer psychology research that treats food only in an instrumental manner. Instead, we focus on the wealth of research that provides insights into the motivated selection of food and its alignment with consumer goals to illuminate what existing research tells us about value-based food consumption. Values have been described as the "single most important construct in social science" because they "summarize the most important goals that

people have in life, thus fueling their decisions" (Kahle & Xie, 2008, p. 575; Rokeach, 1973).

Values are "enduring beliefs about what is fundamentally important and are frequently divided into two types: personal and social." (Ahuvia & Wong, 2002, p. 389; Mueller & Wornhoff, 1990). An individual's values serve not only to guide decisions (Schwartz, 1994) but also affect their sense of purpose when they commit to "act consistently with one's values" (Williams et al., 2022, p. 702). Research on food choices has examined when and why goals and values align with consumers' decisions and behavior (Herman & Polivy, 2014). According to Kahle and Xie (2008, pp. 577–8), "The ultimate reason for many consumer decisions relies on values." For example, consumers today are increasingly considering whether their values of consuming sustainable and healthy foods are reflected in their food choices. A consumer may ask: Does this food align with my goal to support local farmers, protect the environment, avoid pesticides and food additives, or minimize food waste? In this way, our individual values are tied to our beliefs, preferences, ideas, as well as our culture, societal, and family norms (MacInnis et al., 2019). For example, values focused on social justice or equality stem from a desire for "universalism: understanding, appreciation, tolerance, and protection for the welfare of all people and for nature"; these values serve to guide consumers' interactions with others (Schwartz, 1994, p. 22). Thus, value-based eating encompasses a broad array of individual and societal values including environmental sustainability, ethics, social justice, and health.

We root this review in ideas and findings from research on food, value-based eating, and food well-being in consumer psychology, marketing, and associated disciplines. More specifically, we structure the framework for our review around a report by the Rockefeller Foundation (2021) that explores how to grow a value-based societal food system that offers consumers access to healthy and sustainable foods. Societal food systems are the agriculture, production, and marketing channels that move food from producers through intermediaries, such as retailers, to consumers (Bublitz, Peracchio, et al., 2019b). The Rockefeller report focuses on food production and supply, targeting its recommendations to influence value-based food procurement and advocacy by organizations and institutions. In this review, we, as consumer psychologists, focus on consumers and their food choices. We build on the Rockefeller report's framework by providing insights from consumer psychology that explore how value-based eating is propelling consumers to shift what they eat and do not eat. We explore the key values identified in the report—sustainability, ethics, equity, and dining for health—as these values are critical to individual, environmental, and societal well-being. In the section that follows, we present our framework for value-based eating together with consumer psychology and related research illuminating these values.

SEED FRAMEWORK

Our framework for understanding and characterizing how values impact food consumption focuses on those consumer values that are directing consumers to shift what they eat toward plant-based foods. The four critical values that we include in our framework are those identified by the Rockefeller Foundation (2021), values that when adopted collectively by society can transform our food systems to be more sustainable, equitable, and nourishing. These four values, **Sustainability**, **Ethics**, **Equity**, and **Dining for Health**, together constitute the **SEED** Framework for growing value-based eating. Figure 1 depicts the SEED framework—the values that, once planted, together nurture consumers' value-based eating. These values build the momentum needed to shift collective societal food norms, thereby building momentum to change our food systems. We assemble research in consumer psychology and its associated disciplines to explore how and why each of these four values is changing—or in the case of equity highlight the challenge to changing—what people eat and do not eat. We begin with environmental sustainability, the value driving many consumers to ask, “How does what I eat impact the climate crisis?”

Sustainability

Consumers' shift toward plant-based eating is driven by greater awareness of the everyday impact of the climate crisis, heightened recognition of its immediate and devastating environmental consequences, and increased

consciousness that consumption decisions, including food choices, impact environmental sustainability (Reiley, 2021). Importantly, these developments mark a notable shift—not just in terms of interest in plant-based eating—but also in terms of the prioritization of the environment and sustainability when making food choices. The connection between the food people choose to eat and consumers' perceptions of its related environmental impact has lagged behind other types of product choices. For example, the environmental consequences of McDonald's polystyrene sandwich clamshell packaging was a target of consumer boycotts in the 1980s long before consumers became concerned about the environmental impact of the hamburgers contained within those packages (Meyer, 2010). Indeed, the environmental impact of packaging is readily observable, whereas the relatively more abstract link between animal-based food consumption and sustainability has taken longer to enter the public consciousness (Siegrist et al., 2015).

We should note that even recent studies have found that environmental sustainability concerns are not an especially salient issue in food decision-making, with factors such as taste, price, and health being more top-of-mind (Hoek et al., 2017). In fact, relatively recent research has revealed only limited consumer awareness of the remarkable environmental benefits (e.g., reducing greenhouse gas) of reduced meat consumption (do Vale et al., 2016). However, changes observed in the marketplace make it clear that awareness is rapidly increasing (Creswell, 2021; Shirvell, 2020). For example, experts believe that in the United States, where the average family consumes 700 to 1000 pounds of meat per year, “peak meat” consumption has been reached

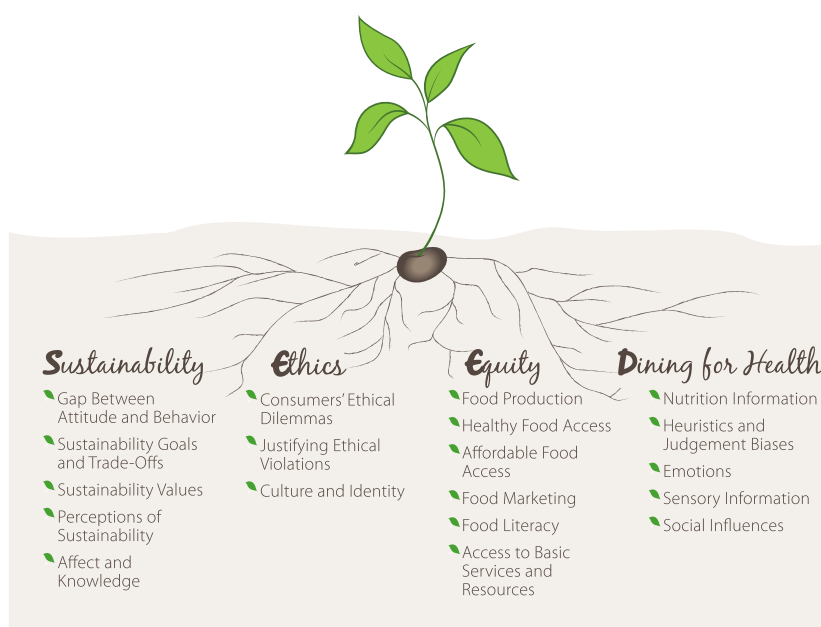


FIGURE 1 SEED framework for growing value-based eating. SEED values (Sustainability, Ethics, Equity, and Dining for health) promoting plant-based diets are changing the way consumers choose what foods to eat and not to eat. The impact on our food system depends on how consumers integrate these values to make food decisions in the future

(Della Volpe, 2022). This is because Generation Z—young people born between the mid 1990s and early 2010s—are shifting toward plant-forward foods, with 60% reporting that they want to reduce their meat consumption (Jed, 2018). Meanwhile, research efforts increasingly are being devoted to developing a better understanding of how environmental information and knowledge related to sustainability affects consumers' food decision-making (Panzone et al., 2020; Schmidt, 2021; Visschers & Siegrist, 2015). Yet, even more research is needed to understand the impact of sustainability on people's food decisions. In what follows, we describe how consumer psychology research in several key areas—the gap between attitude and behavior, goals and trade-offs, sustainability values, perceptions of sustainability, and affect and knowledge—impacts sustainability, and in turn, what people eat and do not eat.

Gap between attitude and behavior

Reviews of research in consumer psychology highlight the wide array of factors that influence environmentally conscious behaviors including food consumption (Gifford & Nilsson, 2014). However, as previous research notes, there is often a gap between consumers' environmental attitudes and the sustainability behaviors they exhibit (Cornil et al., 2014; Davies et al., 2002; Kim & Yoon, 2021). In an effort to bridge this attitude–behavior gap, White, Habib, & Hardisty (White et al., 2019, p. 23) developed a framework to promote sustainable behaviors and encourage more environmental sustainability research. Their SHIFT framework examines how to use Social influence, Habit, the Individual self, Feelings and cognition, and Tangibility to promote environmentally conscious behaviors (Habib et al., 2021; White et al., 2019). Future research should explore specific strategies and promising practices for using the SHIFT framework to encourage sustainable food consumption and plant-based diets.

The consumer psychology literature offers initial insights into how environmental sustainability concerns and attitudes impact decision-making across a variety of domains including food choices. To begin, we know from prior research that many consumers report holding environmental values, but often do not consume in ways that are consistent with those values (Alwitt & Pitts, 1996; Davies et al., 2002; Vermeir et al., 2020). Davies et al. (2002) find that the path for consumers to engage in more sustainable behaviors is far more complex than simply motivating intentions. Specifically, in their investigation of recycling behavior, they find that as attitudes and beliefs become internalized, they create a sense of responsibility to act and more accurately predict future behavior (Davies et al., 2002, p. 87). Vermeir et al. (2020) extend this idea as they explore the role

attitudes play in shaping environmentally sustainable food consumption behaviors. These researchers begin with the proposition that consumers must perceive and value the need to improve the environment; in essence, they must begin with purpose grounded in sustainability (Vermeir et al., 2020). Then, they posit that consumers form and adopt sustainability goals or commitments. These goals further manifest into behavioral intentions and ultimately actions that lead to environmentally sustainable food consumption (Vermeir et al., 2020). By connecting goals to commitments, consumers close the gap between attitude and behavior to make choices that are more consistent with their values (Williams et al., 2022).

Sustainability goals and trade-offs

Consumer psychology research explores how a goal, or a desired end state, motivates behavior as consumers take action to make progress toward that goal (Higgins et al., 2020; Kopetz et al., 2012; Wyer Jr & Xu, 2010). Consumers often have goals that appear to conflict (e.g., a goal to eat less for health reasons may conflict with a consumer's goal to reduce their food waste). So, consumers employ strategies, both consciously and unconsciously, to navigate such goal conflict (Kopetz et al., 2012). Meal planning at home or thoughtful ordering decisions while eating out, for instance, could help consumers accomplish multiple goals (e.g., eat less for health reasons and reduce food waste to protect the environment) simultaneously. Moreover, recent research finds that consumers may overcome goal conflict by making choices they identify as “right”—that is, choices based both on outcome and on a decision-making process conforming to social norms that point to the “right thing to do” (Higgins et al., 2020). Future research should explore how increasing awareness about the sustainability of our food choices shapes consumer goals and decisions about what to eat.

Certainly, consuming in an environmentally conscious manner, with respect to food or other products, can be fraught with trade-offs and complexity. Environmentally friendly food options may cost more, forcing consumers to reconcile environmental values with budgetary considerations (Bhaskaran et al., 2006). Here, however, it is vital to point out that Generation Z—who express a desire to eat less meat—are meeting this particular cost versus sustainability trade-off with a greater willingness to pay more for healthy foods (Campisi, 2020) than older individuals. By prioritizing sustainability and health, these consumers navigate price trade-offs and choose plant-based foods that align with their values. Luchs & Mick (2018, p. 386) explain how consumer decisions such as these build consumer wisdom by establishing “strong doses of gratitude and self-knowledge (including personal values) for improving and maintaining well-being.”

Furthermore, in some situations, it can be challenging for consumers to determine which food products perform “best” in terms of their net impact on the environment. Indeed, a product may perform well on one aspect of sustainability, but poorly on another (Ozanne et al., 2016). For example, reducing packaging on fruits and vegetables uses less plastic, but also may result in a shorter shelf life and more potential for food waste (White & Lockyer, 2020). Consumers also face difficulty making sustainable food choices given that product labels often focus on one specific sustainability issue (e.g., locally grown), which combined with a lack of standardized sustainability labeling across products (Grunert et al., 2014) further complicates consumers' decisions when it comes to trade-offs undertaken in an effort to achieve sustainability goals.

Sustainability values

Consumer psychology research highlights linkages between values and environmental consciousness, attitudes, and behaviors. To assess these linkages, researchers have developed scales to measure and predict consumer purchasing and consumption behaviors that demonstrate environmental sustainability values (Haws et al., 2014). A related line of research inquiry focuses on the three-pronged nature of environmental values, which can be described as altruistic (i.e., concerned for other people), biospheric (i.e., concerned for animals and ecosystems), and egoistic (i.e., concerned for the self) (Schultz, 2001; Schultz et al., 2005; Stern, 2000; Stern & Dietz, 1994). Findings suggest that altruistic and biospheric values are positively associated with more environmentally sustainable attitudes and behavior, whereas egoistic values are negatively associated with environmentally sustainable attitudes and behavior (Buerke et al., 2017; de Groot & Steg, 2008; Kaur & Luchs, 2022; Lee et al., 2014; Nordlund & Garvill, 2003; Steg et al., 2014; Thøgersen & Ölander, 2002).

How can this understanding of what consumers value lead to food choices that offer mutual benefit to the environment and the individual? Consider this: Altruistic and biospheric concerns are related to self-transcendent values (i.e., values that emphasize the interests of others, universalism, and benevolence) and egoistic concerns are associated with self-enhancement values (i.e., values that emphasize one's own interests, power, and achievement) (Schultz, 2001; Schultz et al., 2005; Schwartz, 2012; Stern et al., 1999). Studies show that greater meat consumption is linked to stronger endorsement of self-enhancement values (Allen et al., 2000; Allen & Ng, 2003; Graham & Abrahamse, 2017). However, because reducing meat consumption offers both sustainability (a self-transcendent value) and health (a self-enhancement value) benefits, perhaps messages can be customized to target both these collective and individual benefits. Indeed, De Dominicis

et al. (2017) demonstrate that when personal benefits or gains are addressed in conjunction with environmental concerns, even people motivated by self-interest will increase their engagement with sustainable behaviors. More research is needed to understand how adopting a plant-based diet might provide a pathway to encourage other sustainable behaviors.

Researchers are also investigating how individual differences and situational factors influence sustainability values (Steg et al., 2014). For instance, Kaur and Luchs (2022) found that mindfulness is associated with altruistic and biospheric values while buffering against egoistic values, in turn promoting environmentally conscious consumer actions. Thus, mindfulness may help promote sustainable consumption not only by reducing mindless consumerism and subsequently, waste (Bahl et al., 2016; Block et al., 2016; Wansink & Chandon, 2014), but also by allowing consumers to be more open to behavioral and lifestyle changes that are sustainable (Bahl et al., 2016; Kaur & Luchs, 2022).

Perceptions of sustainability

Consumers may not always view sustainability as an appealing product benefit. Luchs et al. (2010) raise the possibility of “sustainability liability,” whereby environmentally friendly product features backfire because they diminish perceptions of product performance (Haws et al., 2014; Lin & Chang, 2012; Newman et al., 2014; Pancer et al., 2017). For example, environmentally friendly hand sanitizer or laundry detergent may be regarded as less effective in terms of strength-related attributes as compared to traditional versions of these products. However, it appears that these sustainability liability effects can be mitigated by subtle changes in messaging (Luchs et al., 2010). Consider, for example, recent research by Chernev and Blair (2021) documenting that portraying pro-environmental attributes as organization- or company-level values rather than qualities related to an individual product can eliminate and even reverse negative perceptions of environmentally friendly products. Furthermore, connecting a company's or brand's ethos to sustainability-related values may better connect with consumer and their values (Williams et al., 2022). Further research needs to examine sustainability values and the potential sustainability liability as it pertains to the consumption of plant-based foods.

Related consumer psychology research has examined people's perceptions of rescue-based food, that is, excess food containing ingredients that are suitable for people to eat that would typically go to waste largely due to aesthetic issues or excess quantities. A study by de Visser-Amundson et al. (2021) found that promoting the sustainability benefits of rescue-based food, such as its waste-reduction potential, inadvertently evoked negative and disgusting mental representations such

as images of garbage in landfills (de Visser-Amundson et al., 2021), leading to a lower desire to eat such food. By contrast, other research focused on so-called “ugly produce” has found that people will seek to eat these foods when perceptions of aesthetic beauty are expanded (Koo et al., 2019). The ugly produce movement has put an intense spotlight both on how much produce goes to waste and on social equity with respect to who benefits from imperfect produce in the food system (Block et al., 2016). Furthermore, while some farmers and environmental advocates applaud firms such as Imperfect Foods and Misfits Market, which encourage people to eat imperfect produce, detractors argue that these firms reduce access to fresh produce within the emergency food network, which serves people experiencing hunger (Mahamarrov, 2021). More research is needed to examine how perceptions of sustainability impact people's preferences for plant-based foods, and how changes in those preferences impact food access and availability.

Affect and knowledge

Research also highlights the important role of consumer knowledge and affect—particularly negative emotions such as guilt—as important drivers of environmentally sustainable behaviors. Prior research had found that consumers use more of an item when they know that it can be recycled (Catlin & Wang, 2013; Sun & Trudel, 2016) with recycling functioning as a mechanism to reduce negative emotions associated with wasting resources (Sun & Trudel, 2016). In another study, use of pro-environmental labeling on garbage (e.g., relabeling “trash” cans as “landfill”) and recycling bins (e.g., “recycle more, save the earth” vs. “recycle”) evoked negative emotions associated with trashing, which led to an increase in materials placed in recycling bins, including many items which could not be recycled (Catlin et al., 2021). This phenomenon of “wish-cycling”—wherein consumers toss items into the recycling bin *hoping* to reduce their negative impact on the environment—may alleviate people's guilt about generating waste and license over-consumption. However, it actually creates larger problems within the recycling stream, with these items ultimately being diverted to a landfill. This research shows that while consumers are increasingly knowledgeable about the negative impact of generating waste and are eager to recycle more in an effort to reduce that waste, their behaviors may not have the intended effect.

Knowledge about the connection between animal agriculture, meat consumption, and climate change may influence consumers to shift what they eat. However, studies suggest that when animals are anthropomorphized, consumers try to reduce their guilt by choosing to eat a healthier meat dish to justify their meat consumption (Kim & Yoon, 2021). These findings reinforce the critical importance of consumer knowledge and

misconceptions about sustainability. For example, just as consumers may be overly optimistic about the benefits of recycling (Catlin & Wang, 2013), they also appear to underestimate the environmentally beneficial impact of decreased meat consumption (de Boer et al., 2016). To address this, organizations such as One Meal a Day for the Planet (OMD) are promoting ways to encourage more people to take steps toward plant-based eating. OMD also supports collective consumer activism to encourage institutional food providers, restaurants and schools, to offer more plant-based food options and works to amplify efforts to transition people's diets toward more sustainable foods (OMD, 2022).

It is important to keep in mind that evidence suggests that consumer knowledge, beliefs, and feelings related to environmentally sustainable food consumption have evolved and will continue to do so. Consumer psychology research is positioned to help social marketers, policy makers, the food industry, and consumers better understand how together we can make progress toward eating more sustainable foods. Next, we examine the impact of ethics, the value prompting consumers to ask, “How closely do my moral beliefs align with what I eat?”

Ethics

Ethics in our framework encompasses two areas that impact plant-based eating: animal welfare and biodiversity loss. Consumer concerns about animal welfare, “the physical and mental state of an animal in relation to the conditions in which it lives and dies,” have grown substantially over the past decade (WOAH, 2021). Today's consumers are also increasingly concerned with biodiversity loss—the disappearance of species from the natural environment largely induced by intensive farming, forestry, and fishing (European Commission, 2019). These ethical concerns about animal welfare and biodiversity loss, which intersect with sustainability and equity in food production and food access, impact consumers as they decide what to eat and what not to eat (Campbell & Winterich, 2018; Haws et al., 2014). In this section, we explore key consumer psychology research that offers insights into how consumers navigate ethical dilemmas, justify ethical violations, and reconcile issues related to their culture and identity vis-à-vis their food choices.

Navigating ethical dilemmas

Prohibition against inflicting harm is one of the most deeply held universal ethical and moral beliefs, emerging across countries and cultures (Gray et al., 2012). Because of people's desire to be ethical, moral, and be seen by others as such (Klass, 1978), consumption decisions that bring harm to animals and the environment

(i.e., biodiversity) can be psychologically problematic and increase consumer guilt (e.g. Kim & Yoon, 2021). Inconsistencies between moral standards of ethical consumption and actual consumption decisions create internal cognitive dissonance that consumers are motivated to resolve (Bastian & Loughnan, 2017). Consumers may experience such dissonance *before* or *after* (i.e., *anticipated* versus *experienced* dissonance) they make unethical consumption decisions (Barkan et al., 2015). While this psychological conflict can be assuaged with decisions that respect animal welfare and biodiversity, consumers may instead seek to disengage from moral standards of behavior (Wang et al., 2019). Moral disengagement allows people to reduce the gap between moral standards and their own behaviors (Shu et al., 2011), diminishing their concerns about violating moral norms (Bandura, 1999) and reducing the negative affect associated with unethical consumption decisions (Kim & Yoon, 2021). Helping consumers to see “the bigger picture of situations and decisions” may help them navigate “multiple and often contradictory issues,” as they balance values and ethics with “short-term and long-term” goals as well as “consider a wide range of stakeholders” (Luchs & Mick, 2018, p. 367). As people move toward plant-based diets, how might consumption guilt for violating a self-imposed goal (e.g., avoid eating meat) or moral norm impact their plant-based eating? Future research should explore how anticipated or experienced consumption guilt encourages, or perhaps has the unintended consequence of discouraging, diets that reduce meat and animal product consumption.

One way to resolve anticipated ethical and psychological dissonance is through moral licensing, wherein people behave as though acting ethically earns them moral credit that can cancel out future unethical behaviors (Catlin & Wang, 2013; Schwabe et al., 2018). For example, a consumer who purchases a plant-based food may feel licensed to make a subsequent consumption decision that disregards animal welfare. Similarly, if people anticipate guilt from consuming meat, making a food choice with lower environmental impact (e.g., consuming smaller animals, using less meat overall, or purchasing meat in sustainable packaging) can license their choice to eat meat. People may also engage in self-serving altruism to mitigate their anticipated dissonance. For example, because unethical choices that only benefit the self are perceived as selfish and are consequently harder to justify, individuals focus on the potential benefit of their choices to others to justify unethical decisions (Gino et al., 2013; Wiltermuth, 2011). In such a scenario, a parent might justify purchasing meat by citing the health benefits that accrue from their children consuming protein-rich foods. More research is needed to understand the complex web of trade-offs people navigate as they strive to reduce guilt, resolve moral dilemmas, and eat more plant-based foods.

Justifying ethical violations

To resolve ethical dissonance, people also engage in post-violation justifications that reduce their feelings of guilt and reestablish their moral self-image. These strategies may include moral cleansing, flexible food categorization, motivated forgetting, outsourcing responsibility, and health-based justifications. Moral cleansing takes place when unethical behavior activates negative mental representations of the self, prompting people who commit a moral violation to engage in cleansing ritual (e.g., going to confession) or behavior (e.g. making a donation, particularly when the donation falls within the same domain as the immoral behavior) to reestablish themselves as moral (Fanghella & Thøgersen, 2022; Mathras et al., 2016). When consumers' moral self-worth is threatened, they become motivated to make consumption decisions that bolster their shaken self-identity (Gao et al., 2009). For example, a consumer who experiences a moral conflict after purchasing meat might subsequently purchase vegan products to restore the consumer's self-view as that of an ethical person (Fanghella & Thøgersen, 2022). Future research should examine if these effects help or undermine goals to move toward a plant-based diet. For example, if consumers learn they can compensate post-consumption to alleviate the guilt they feel about eating meat, how does this license future eating behaviors that violate their plant-based goals?

Another justification strategy consumers employ is flexible food categorizations—creatively assigning food items into multiple mental categories (Khare & Chowdhury, 2015). Categorization flexibility enables people to make harder-to-justify choices by allowing them to process information globally, disregarding threatening product attributes (Khare & Chowdhury, 2015). For example, consumers categorize animals they eat as “food,” not as living beings, to justify what they eat (Bratanova et al., 2011). Flexible mental categorization is also enabled by societal practices. In the marketplace, the names of the food people purchase are different from the name of the animal from which it originates: pig meat is marketed as pork, cow meat as beef, and calf meat as veal. This strategy creates psychological distance between meat products and animals, reducing the cognitive dissonance people may experience when they eat meat (Bastian & Loughnan, 2017). Categorization flexibility allows consumers to sever the association between what they eat and the ethical impact of those decisions, licensing their meat consumption. More research should explore the impact of categorization flexibility on plant-based eating.

Motivated forgetting is another strategy for reconciling food choices with moral standards. People are less likely to remember unethical product attributes because suppressing negative information allows them to avoid the negative feelings associated with their own consumption decisions (Reczek et al., 2018). For example,

a consumer might be less likely to remember the cruelty involved in salmon farming after ordering—and enjoying—glazed salmon at their favorite restaurant. When food is prepared by others, cognitive dissonance involved with unethical consumption may decrease. For example, outsourcing responsibility for consumption can reduce the guilt associated with the decision (Hagen et al., 2017, 2019). When dining at a friend's home, consumers may blame their unethical food consumption on the host to justify their consumption. They may also use health justifications to defend unethical food choices. For instance, Kim and Yoon (2021) find that selecting healthier meat dishes (e.g., grilled versus deep-fried chicken) allows some people to reduce their guilt because the health benefits of healthy meat options are perceived to outweigh the harm caused by meat consumption. More research should investigate the complex ethical processes people use to decide what to eat. In particular, future research should examine how such ethical dilemmas impact consumers' cognitive and behavioral strategies for plant-based eating.

Reconciling culture and identity

Culture refers to a set of norms, values, religious beliefs, cultural systems, institutions, practices, policies, and social structures that shape and direct human behavior (Markus & Kitayama, 2010). Culture impacts ethical consumption (Swaidan, 2012) and influences food decision-making. Food is a means to express and celebrate culture and a pillar of people's cultural identities that is deeply embedded in their traditions (Block et al., 2011; Parasecoli, 2014). Eating certain foods is often symbolically associated with specific cultural identities; for example, the consumption of beef is strongly associated with Western culture (Rozin et al., 2012), but less with Indian culture (Corichi, 2021). Cultural identities may also encompass religious beliefs that dictate what is appropriate to eat as a way of practicing one's faith. For example, Muslims and Jews abstain from consuming pork and consume beef only if prepared in accordance with specific and customary Halal or Kosher practices (Link, 2021). According to Mathras et al. (2016, p. 300), "Religions provide members with a unique set of beliefs ("systems of meaning" and "view of the sacred"), rituals ("pattern of life"), values ("worldview...of what ultimately matters"), and community ("community of faith")." How might adopting a plant-based diet in accordance with religious values and beliefs impact goal commitment? Future research should examine whether and when building on consumers' existing cultural beliefs, identity, practices, and values promotes plant-based diets or is viewed as co-opting culture in ways that repel consumers.

People are motivated to make consumption decisions that are consistent with their self-identity

(Oyserman, 2009), largely because such decisions allow them to express themselves and identify who they are (Belk, 1988; Dunning, 2007; Oyserman, 2009). For example, people in the United States consume meat during holidays (e.g., Thanksgiving turkey) and other celebrations (Wallendorf & Arnould, 1991), often without reflecting on the ethical impact of their choices on animal and environmental welfare (Bastian & Loughnan, 2017). Indeed, these culturally congruent consumption choices allow consumers to express their valued cultural identities (Mok & Morris, 2013). However, as people move toward plant-based diets, they must navigate potential conflict between their ethical beliefs and their culturally related food consumption practices. In fact, people may find it especially difficult to *not* participate in these cultural food practices due to social pressure to conform. More research should examine the impact of culture, identity, and related ethical issues on what people eat and do not eat, particularly for plant-based diets. Next, we examine how the values of equity and social justice are moving consumers to ask, "What steps are needed to ensure everyone has the opportunity to adopt a plant-based diet?"

Equity

Even as consumers embrace a plant-based diet as a vehicle for putting their sustainability and ethical values into practice, there is growing recognition that many individuals are deprived of such opportunity due to a lack of equity, which in our framework refers to valuing fairness and social justice with respect to accessing plant-based foods. More broadly, food equity means offering all people affordable access to food that allows them to thrive (Bublitz, Hansen, et al., 2019a). Consider this: In the United States, Black households are two and a half times more likely to experience hunger than white households while Latinx households experience hunger at two times the rate of white households (McKinsey, 2021). Marginalized communities, in particular communities of color, often have limited access to healthy, affordable foods such as fruits and vegetables, which are essential to plant-based eating. Food inequity and injustice "disproportionately burdens people of color, who are more likely to suffer from diet-related diseases, have less access to water and sanitation, and often work in food production jobs for less than a living wage" (Rockefeller Foundation, 2021). Thus, recognizing and working to reduce equity gaps with respect to accessing plant-based foods have the potential to benefit people's health and well-being by increasing their consumption of healthier foods.

The dual forces of the COVID-19 pandemic, together with the Black Lives Matter movement, brought these long-standing food equity issues to the forefront. During the pandemic, hunger grew dramatically and

captured people's attention as one in six Americans, 54 million people, experienced hunger (Balch, 2020). The pandemic revealed how systemic, inequitable access to healthy foods—fruits, vegetables, and other plant-based foods—in communities of color increased people's health risks. Inequitable access to such foods puts people at much higher risk for diet-related diseases, in turn making them more vulnerable to COVID-19. Studies have found that two-thirds of COVID-19 hospital admissions can be attributed to four diet-related diseases: obesity, hypertension, diabetes, and heart failure (Jenkins, 2022). Due to compromised community food access that limits what people can eat, these diseases disproportionately impact people of color. Increasing access to plant-based foods has the potential to reduce this inequity.

Such inequity—situations in which one group of individuals unjustifiably receives better access to resources, rights, opportunities, and treatment than other groups—is largely perceived to be unjust and aversive (LoBue et al., 2011). This sense of injustice even occurs among groups that benefit from the inequity (Nardini et al., 2021), such that even those who benefit experience discomfort when they receive preferential treatment in the presence of others who do not receive the same benefits (Jiang et al., 2013). These equity and social justice concerns, in turn, impact consumer thought and action (Goya-Tocchetto & Payne, 2022; Ordabayeva & Lisjak, 2022). For example, those with limited access may respond to such experiences by purchasing products that they believe represent wealth and status while those with greater access may respond by “engaging in minimalist consumption” (Ordabayeva & Lisjak, 2022, p. 170). More research should examine how food equity concerns impact people's beliefs, perceptions, and actions, particularly with regard to plant-based food consumption.

In what follows, we will detail how issues related to equity and social justice in several key areas—food production, healthy food access, affordable access, food marketing, food literacy, and access to basic services and resources—impact what people eat and do not eat.

Food production

Concerns related to food equity are evident in issues related to food production, and specifically, in the plight of farmers and others within the agricultural industry. These groups not only endure low wages and a lack of employee benefits, but also the long hours and often dangerous work needed to feed society. Most of the profit made from farm products goes not to the farmers themselves, but to companies that have alliances within the food value chain (Anderson, 2008). In situations like this, where a disproportionate amount of profit and wealth is concentrated among a particular group or industry, such inequity can cause decreased product desirability as consumers use their marketplace power to

right the inequality (Mohan et al., 2018; Ordabayeva & Lisjak, 2022).

All of these challenges that plague farmers, as well as food service workers such as restaurant and grocery store employees, were exacerbated by the COVID-19 pandemic. During the pandemic, these workers were labeled “essential” despite the low pay they receive. Moreover, the pandemic highlighted the working conditions and physical and psychological toll that farmers, food service workers, and their families face. For instance, farmworkers in Monterey County, California, had a COVID infection rate four-times higher than that of the local population (Mora et al., 2021). Some infected farmworkers reported that they had worked alongside someone known to be infected or showing COVID symptoms but were unable to space out from those coworkers given their tight working conditions (Chen et al., 2021). In sum, although food workers are deemed essential, they were not afforded essential resources and safe working conditions during the pandemic (Becot et al., 2020). Future research should examine how consumers' food perceptions and eating behaviors are altered by sharing the experiences of people involved with food production.

Farmers, farmworkers, and restaurant employees are among those most likely to experience inequity in food access due to low pay. Such inequity is broader than finding food to eat; it also means limited access to affordable foods that not only meet a family's needs and cultural food preferences, but also benefit people's health and allow them to thrive. It should be acknowledged that efforts to promote plant-based diets could increase demand for fresh fruits and vegetables in ways that then exacerbate poor working conditions and food inequality for farmers and agricultural workers. Research exploring plant-based eating should examine how to promote safe and fair working conditions and other equity issues surrounding plant-based diets. Next, we examine how access to healthy food impacts what people eat.

Healthy food access

Equitable access to healthy food is a vital issue. Fruits, vegetables, and other plant-based, nutritious food are widely available and accessible in higher income communities (Gordon et al., 2011). In lower income communities, however, “food deserts, neighborhoods devoid of retail enterprises offering fresh and healthy foods, are critical barriers” to accessing such food (Bublitz, Hansen, et al., 2019a, p. 140), thereby diminishing people's health and well-being. As defined by the FDA, food desert neighborhoods have a poverty rate greater than 20% plus low access to fresh foods; low access means 33% of residents live more than 1 mile (10 miles in rural communities) from the nearest large grocery store. (Dutko et al., 2012). People living in both urban and rural food deserts are required to travel long distances

and bear a high financial cost to access healthy foods. At the same time, low-income consumers are more likely to have inflexible work schedules that make it difficult for them to expend time traveling to a nearby community to shop (Inglis et al., 2005; Rogus, 2018). According to Kaplan (2022), “While we are all influenced by our neighborhoods, low-income people are much more dependent on the socioeconomic context of the place where they live.”

Income, race, and age impact access to healthy, plant-based foods. Low-income people of color are more likely to live in food deserts which limits their access to healthy food (Bublitz, Hansen, et al., 2019a; Grier & Kumanyika, 2008). Seniors may struggle physically to shop for groceries—restricting what they eat to options that they can transport themselves or which can be delivered to their homes (Wilson et al., 2004). Such difficulties are magnified when consumers, especially seniors, do not have reliable personal transportation and must rely on public transportation, which makes the commute to access affordable and healthy food longer and the return home carrying bags of groceries more arduous. Research in consumer psychology makes it clear that people are keenly aware of and negatively impacted by their own discrepancy in access relative to that of other consumers (Hagerty et al., 2022; Henderson et al., 2011; Nikiforidis et al., 2018; Shrum, 2022). Motivated by their values and a desire to protect people who are vulnerable, some communities, organizations, and consumers are taking action to bridge the gaps and increase healthy food access. What innovative programs could make plant-based foods more readily available to seniors, and also children, who struggle with healthy food access? More research on these vital issues—including the question of whether structural barriers interact with perceived discrepancy in access to create a negative reinforcement cycle—is needed.

When consumers observe injustice in access to food, they may respond by donating food or money to those who are in need (Farmer et al., 2020). For example, during the pandemic, 60% of Americans report donating to a food pantry (Jones, 2020). However, as the number of requests for such donations increase, the number of donations often decrease (Ein-Gar et al., 2021). Furthermore, culture and power differences play a role in such donations (Oyserman, 2006; Winterich & Zhang, 2014). Winterich and Zhang (2014) found that people who live in communities with high power distance (i.e., communities where residents are more likely to find inequity acceptable) are less likely to donate to help those in need. Marketers have identified creative ways to encourage people to donate, such as rounding up at a restaurant or grocery store (Kelting et al., 2019). More research should explore ways to encourage consumers to take action, including volunteering and donating, to address equity in access to healthy, plant-based food.

Affordable food access

Even when healthy food is available locally, affordable access is a barrier to purchasing these foods. In lower income communities, consumers often face disproportionately higher prices for food as compared to prices for the same foods offered in higher income neighborhoods (Gordon et al., 2011; Kaufman et al., 1997). Research has compared food access and prices by store type for several categories of retailers in lower versus higher income communities: large grocery stores, small markets, and convenience stores (Gosliner et al., 2017). In lower income communities, on average, food costs are 37% higher in small markets, 27% higher in large grocery stores, and 102% higher in convenience stores (Gosliner et al., 2017). In addition to paying higher prices for food, lower income consumers also miss out on opportunities to save money by purchasing food in bulk (Orhun & Palazzolo, 2019) because doing so involves higher upfront costs (Mende et al., 2020). Also, when affordable food is scarce, consumers feel deprived, triggering negative eating behaviors (e.g., consuming more calories) that undermines health (Salerno & Sevilla, 2019). Consider as well that in low-income communities where access to fresh and healthy food is limited, fast-food restaurants offering cheaper and less healthy foods often are abundant (Grier & Davis, 2013). These inequities in affordable food access compound, resulting in detrimental health outcomes for lower income, marginalized consumers.

Even if consumers have the time and financial means to travel to a nearby community to shop for affordable food, social and physical risks, as well as safety concerns, may prevent them from doing so. The phenomenon of racial profiling of Black consumers in predominantly white areas, for example, leads Black consumers to experience psychological stress as they fear for their personal safety (Grier et al., 2022; Mulligan et al., 2020). As consumers of color observe discrepancies between the treatment they receive compared to others (Henderson et al., 2011), they experience a magnified sense of being outsiders, which affects how safe they feel leaving their own community in search of affordable food access.

Food marketing

Marketers disproportionately use advertising to target consumers of color with less expensive, less healthful products (Grier & Davis, 2013). Such advertisements are featured in commercials during the programs these consumers watch and in magazine ads targeting people of color (Grier & Kumanyika, 2008). Such advertising makes consumers more likely to consider an advertised product when they feel hungry (Janiszewski & Wyer Jr, 2014). Advertising and its priming of subtle product cues, such as a brand tagline, can lead consumers to feel that advertised products are readily available

and easier to access (Brasel & Gips, 2011; Janiszewski & Wyer Jr, 2014; Verwijmeren et al., 2011). Furthermore, the process of resisting the lure of foods featured in advertising is cognitively depleting (do Vale et al., 2016), increasing the likelihood of ultimately giving in and consuming these products (Pandelaere et al., 2010). All of these marketing practices lead to health disparities for people of color. For example, diets higher in sugar have been shown to lead to heart disease (DiNicolantonio et al., 2016). Disproportionate targeting of Black and Latinx consumers with high-sugar, low-nutrient products may help to explain why these consumers experience higher rates of heart failure (Yancy, 2005) and diabetes (HHS, 2022). Ultimately, advertising combined with increased availability of cheaper, unhealthy foods in low-income communities undermines people's health and reduces food equity. Conversely, marketing strategies promoting healthy food options have the potential to increase consumer demand for plant-based foods. More research should examine the influence of food marketing and advertising on plant-based eating, food equity, and consumer health.

Food literacy

Food literacy consists of three components: (1) “factual knowledge about food and nutrition,” (2) “procedural knowledge, such as food scripts or routines (e.g., how to prepare and cook squash),” and (3) “the ability, opportunity, and motivation to apply or use that [food] knowledge” (Bublitz, Hansen, et al., 2019a, p. 145; Block et al., 2011). It includes an understanding of how foods affect one's body and knowledge about the nutritional quality of food and dietary recommendations (McKinnon et al., 2014). For example, understanding that eating foods that are high in calories, sugar, and fat but low in nutrients increases rates of cancer and heart disease (Goncalves et al., 2019; Temple, 2018), leads people to avoid high-calorie foods when nutrition information is present (Gomez & Torelli, 2015). Notably, lower income consumers, people of color, and men are less likely to possess sufficient knowledge of healthy foods and food preparation as compared to higher income, majority, and female consumers (Kimura, 2011; McKinnon et al., 2014; Peltzer, 2004). In part, this stems from education discrepancies such that children who attend schools in under-resourced communities have little exposure to food literacy programs and thus fewer of the resources needed to develop such knowledge (Bublitz, Hansen, et al., 2019a). Future research should examine how to expand food literacy to include knowledge about the sustainability, ethics, and equity of plant-based food choices. Since school breakfast and school lunch programs feed so many of our nation's children, how can school meals be revitalized to increase the number of plant-based options and encourage students to try the

new foods they are exposed to at school? What policy and funding decisions can make healthy plant-based school meals available but also palatable and enjoyable to minimize food waste?

Access to basic services and resources

Access to tools for cooking—stoves, microwaves, freezers, knives, pans—and safe drinking water and electricity are required to prepare food. When people do not have access to these necessary and essential resources, the food they eat is less healthy, of lower quality, and higher in fat because it must be prepackaged or easy to prepare (Clark-Barol et al., 2021; Pritt et al., 2018). Lower income households have compromised access to tools for cooking and other basic services that support the utilization of food (Bublitz, Hansen, et al., 2019a). Nearly one-third of consumers using food pantries reported that they were unable to consume the food received from the pantry, in part because they lacked can openers or the electricity required for food preparation (Clark-Barol et al., 2021; Pritt et al., 2018). Research has found that 25% of low-income people using a meal program to access foods lack the means to keep food cold (Weinfeld et al., 2014), which limits their ability to store leftover food and leads to food waste and future hunger (Porpino et al., 2015).

In emergencies and climate disasters, low-income consumers and people of color are often at higher risk for disrupted access to safe and healthy food. A study on the impact of severe winter storms in Texas in 2021, for example, found that low-income people and people of color experienced more frequent blackouts (Dobbins & Tabuchi, 2021). Power outages can also be intentionally scheduled as California does to avoid forest fires. Notably, these planned power outages are more likely to occur in lower income communities and neighborhoods where people of color live (Botts, 2019). Whenever a power outage occurs, consumers stand to lose all the food stored in their refrigerators and freezers, particularly if they lack backup resources (e.g., a generator) to preserve their food. Next, we examine how health concerns are prompting consumers to ask, “How does what I eat affect my health?”

Dining for health

Consumers' shift toward plant-based eating—and the desire to do so even among those not afforded such an opportunity due to structural barriers and system-level failures rooted in inequity—is often motivated by health concerns. People are increasingly becoming aware of the connection between diet and health (Reiley, 2021). Eating plant-based foods “delivers a personal [health] benefit to consumers” and further

motivates people to shift toward a plant-based diet (Hoek et al., 2017, p. 127). Indeed, Michael Pollan, professor of science and environmental journalism at the University of California, Berkeley, and the author of many books exploring eating, holds that everything we know about food and health can be summed up in seven words: “Eat food, not too much, mostly plants” (Pollan, 2008). When consumers recognize the benefits that healthy foods provide, their enjoyment in selecting and consuming these foods increases (Gomez & Torelli, 2015). By making choices that align with their values, consumers may feel a sense of accomplishment and wisdom (Luchs & Mick, 2018). Eating healthy foods results in consumers feeling good about themselves for having invested in their overall health and well-being, with such positive emotions enhancing and reinforcing healthy eating (Gardner et al., 2014). More research should explore how to amplify consumers' positive experience of healthy, plant-based eating.

It should be noted, however, that although people in the United States are eating more fruits and vegetables today than in 1970, their consumption of plant-based foods falls far short of dietary guidelines, and their consumption of meat, eggs, and grains exceeds recommendations (McKinsey, 2021). This suggests that there is substantial opportunity for more consumers to shift toward plant-based eating to realize health benefits. As noted by the Rockefeller Foundation (2021), “Poor nutrition is now the leading cause of poor health in the United States.” In this section, we explore several key areas that offer insights into dining for health: nutrition information, heuristics and judgment biases, emotions, sensory information, and social influences.

Nutrition information

Much of the research designed to shift consumers toward healthy eating has focused on improved communication of nutrition information (for a review see Andrews et al., 2017). However, consumers find health claims and nutrition labeling to be confusing (André et al., 2019). When consumers do not understand nutrition information, they are more likely to select foods they perceive as tastier, but which are often less healthy (Gomez & Torelli, 2015). Future research should explore how to promote plant-based diets by drawing on the wealth of consumer psychology research focused on food decision-making to position and communicate the positive taste and health attributes of plant-based foods in ways that increase demand. The complexity of incorporating nutrition information into food decisions often encourages consumers to “rely [instead] on contextual cues for food choices, even if these are not diagnostic for food healthiness” (Li et al., 2022, p. 326). Such contextual cues include food weight, with foods that are lighter in weight perceived to be healthy as they evoke a broader meaning

of the word “light” (Li et al., 2022). Other research has found that making a simple change, such as presenting calorie information first on restaurant menus (i.e., to the left of the menu item) yields lower calorie, healthier food selections by consumers who read left to right (Dallas et al., 2019).

Yet, consumer psychology research indicates that communicating health and nutrition information can actually undermine healthy choices, with consumers anticipating less enjoyment from foods they believe are healthy (Gomez & Torelli, 2015; Krishna & Elder, 2021; Raghunathan et al., 2006; Suher et al., 2016). Indeed, research found that nutrition information reduced French consumers' assessment of the quality of food and their expected level of enjoyment of that food. That is because health cues are perceived to interfere with the pleasure-seeking food goals that constitute a pillar of French consumers' cultural identity (Gomez & Torelli, 2015). In other cases, consumers sometimes use nutritional information strategically to license a choice that violates their health goals (Mukhopadhyay & Johar, 2009; Touré-Tillery & Fishbach, 2011). Consider, for example, dieters who reward themselves with dessert (Fishbach & Dhar, 2005; Mukhopadhyay & Johar, 2008; Wilcox et al., 2009). In general, lower levels of nutrition knowledge make consumers more susceptible to such biases and shortcuts that undermine healthy eating (e.g., Andrews et al., 2009; Dallas et al., 2019). Future research should investigate ways to communicate nutrition information that shifts people toward healthy plant-based diets.

Heuristics and judgment biases

Heuristics, or quick and efficient judgment rules, often guide consumers' food decisions. Consumers have many heuristics for judging the healthiness of food. They believe, for example, that expensive foods are healthier than less costly items (Haws et al., 2017), that healthy foods are less filling than unhealthy choices (Suher et al., 2016), and that tasty foods are less healthy than blander options (Raghunathan et al., 2006). In researching consumer evaluations of meat and meat substitutes, Hartmann et al. (2022) find that consumers' “natural is better [i.e., healthier] heuristic” negatively influences people's evaluation of the healthiness of meat substitutes as compared to their meat counterparts due to perceptions about how meat substitutes are made. Increasingly, consumer psychology researchers are exploring how to use these and other health-related heuristics to nudge consumers toward healthier food choices. For example, how might public health messaging combat years of stored knowledge that leads some consumers to consider plant-based diets to be less healthy or inferior to meat-based diets? Research examining traditional public policy approaches designed to shift consumption—including education, taxation,

and regulation—has substantial potential to have a positive impact on what consumers eat and do not eat (Roberto et al., 2014).

Food research has also revealed many perceptual biases that impact people's assessments of food healthiness. The sound of a brand name (Spence, 2012), visual imagery (Deng & Kahn, 2009), packaging shape (Raghubir & Krishna, 1999; Spence, 2012), size labeling (Aydinoğlu & Krishna, 2011; Sharpe et al., 2008), portion size (Zlatevska et al., 2014), and single- versus multi-serve packaging (Ilyuk & Block, 2016) all impact perceptions related to healthiness and can alter what people eat. A positive halo surrounding the word 'light,' which evokes positive health benefits (i.e., lower calorie), results in more positive evaluations as well as increased consumption of light-colored, hedonic foods (Madzharov et al., 2016). Other research finds that an image on the outside of a product package depicting more (versus fewer) items prompts estimates of greater quantities of food inside, leading people to eat more (Madzharov & Block, 2010). Marketers rely on strategies such as these for framing and positioning brands, food items, and portion size to tap into consumer biases and promote perceptions of healthiness (Cornil et al., 2022). Yet, research also highlights how fresh and healthy plant-based foods rely on a nutrition promotion approach rather than leveraging positive marketing to influence consumers' taste perceptions (Bublitz & Peracchio, 2015). Plant-based foods, fruits and vegetables, often lack packaging that can serve as a communication and promotional tool to attract attention on the store shelf. More research should examine how to strategically use positive marketing and consumers' biases to nudge them toward sustainable, ethical, equitable, plant-based foods.

Research also reveals how consumers' desire to eat healthy food can have unintended negative consequences. Adding a healthy item to a meal can bias calorie estimates (Chernev, 2011) and serve as a "motivational antecedent" that licenses indulgent choices. Consider that adding a healthy topping (e.g., strawberries) to an unhealthy food (e.g., ice cream) biases consumers' calorie estimation and allows people to justify their choice (Jiang & Lei, 2014) even though adding more food—even healthy food—increases its calorie count. This same bias, however, is not evident when adding healthy toppings (e.g., strawberries) to a healthier base (e.g., yogurt; Jiang & Lei, 2014).

Emotions

Consumers' emotions often lead them to seek out certain foods. Sadness, for example, prompts consumers to eat unhealthy foods (Garg & Lerner, 2013). Consumers in a negative mood prefer indulgent over healthy foods as they try to leverage the positive experience they expect to have when eating an indulgent food as a way to repair their mood (Gardner et al., 2014). By contrast, consumers in a

positive mood are more likely to consider the long-term impact of their food choices, prioritizing "higher-level benefits of foods such as health and well-being" (Gardner et al., 2014). However, positive emotions do not always result in eating healthy food; they have also been associated with seeking out hedonic foods. Positive affect leads to increased food cravings, stronger intentions to buy food, and increased salivation in response to vivid food images (Moore & Konrath, 2015). Similarly, consumers who experience gratitude may feel that they deserve a treat and subsequently eat more sweets (Schlosser, 2015).

Recent research proposes that training consumers to anticipate the regret they feel after eating indulgent foods may help them navigate food choices and shift them toward healthier eating (Vosgerau et al., 2020). Can these same forces be used to promote sustainable, ethical, equitable, and healthy plant-based foods? How might anticipatory regret be used to shift more consumers toward healthy, plant-based options? What are the risks of tapping into regret as a motivational force to change dietary patterns? More research is needed to understand how regret and guilt interact with other forces to influence plant-based food consumption.

Sensory information

Our senses play a critical role in our enjoyment of food and dining for health. While we often think of taste as playing a prominent role in food decisions, research clearly demonstrates that taste is a composite of all the senses (Krishna, 2012). Visual appeal, smell, sound, and feel—including both tactile and oral haptics or texture—play a critical role in taste perceptions (Krishna & Elder, 2021). Sensory information such as food temperature (Yamim et al., 2020), packaging texture (Ferreira, 2019), color (Madzharov et al., 2016), ambient scent (Biswas & Szocs, 2019), as well as background noise and sound (Biswas et al., 2019) affect people's perceptions, judgments, and—ultimately—the healthiness of their food choices. Learned sensory associations developed through repeated exposure over time (e.g., the tendency for chips and less healthy snacks to be sold in visually appealing glossy packages) influence consumer perceptions of tastiness and healthfulness (Ye et al., 2020). More research should examine how to leverage sensory cues to promote healthy plant-based dietary shifts.

Food advertising frequently features hedonic, less healthy foods and uses techniques known to stimulate emotional desires and create sensory appeal (Bublitz & Peracchio, 2015). Such advertising increases consumers' propensity to eat, often without centering or prioritizing the health benefits of food (Campbell et al., 2016; Harris et al., 2009). Today, images of food on social media are more prevalent than they were a few years ago as consumers post and seek out multisensory images of food via social media platforms where they engage with,

and thus are exposed to, hedonic, calorie-laden foods (Pancer et al., 2022). These social media images can also be used to make food look appealing, perhaps attracting more consumers to try plant-based foods. How can social media imagery help create new opportunities to promote plant-based foods? Do photos of decadently prepared vegetables persuade consumers to eat plant-based foods? Future research should explore how food advertising, particularly via social media, influences plant-based eating.

Social influences

Dining together is often at the heart of forming relationships with others. When we eat with others, consuming similar foods increases liking and feelings of closeness, which subsequently increases trust and cooperation (Woolley & Fishbach, 2017). Food, therefore, is a critical tool families use to socialize children when dining together (Block et al., 2011; MacInnis et al., 2019). Dining together often provides families an opportunity to transmit culture, family traditions, and other values. Furthermore, eating in social settings leads consumers to base what and how much they eat on social cues, matching what others eat rather than being guided by their own eating intentions or personal satiation (Wansink & Chandon, 2014). What and how much consumers eat is not only affected by dining partners but also by the body type of the person who serves the meal (McFerran et al., 2010). Yet, these social influences do not necessarily lead consumers to make better choices. Sharing food with another reduces perceived ownership of the experience, changing how consumers view the foods they eat and “biasing how consumers construe the consequence of their calorie intake” (Taylor & Noseworthy, 2021, p. 781). Thus, social influence in the form of positive peer pressure may offer a fruitful way to encourage consumers to eat sustainable, equitable, and nourishing plant-based foods that advance the health of individuals, the environment, and society. Consumers participate in all kinds of online challenges with the power to change food consumption behaviors. How can these challenges, which encourage short-term plant-based dietary shifts (e.g., no meat for a week, meatless Monday, or One-Meal-a-Day for the Planet), lead to lasting change toward sustainable, ethical, equitable, and healthy diets? More research is needed to understand how consumers navigate the complex array of social influences that drive food choices and how best to harness the power of social influence to promote value-based food consumption.

INTERPLAY OF VALUES

While the values included in the SEED framework—sustainability, ethics, equity, and dining for health—are

distinct, in practice, these values interact with and influence each other. For example, the lack of opportunity afforded many individuals to access a plant-based diet—one result of longstanding inequity and social injustice—has ramifications for their ability to live in environmentally sustainable, ethical, and healthful ways. Indeed, as depicted in Figure 1, like roots emanating from a seed, SEED values intertwine and grow together to impact both what people eat and do not eat. As consumers become more aware of how plant-based eating aligns with a multiplicity of their values, many are adopting a plant-based diet (Hopwood et al., 2020). In some instances, making a food choice that aligns with more than one of the values included in the SEED framework is relatively straightforward. For example, purchasing apples from a local farmer may simultaneously satisfy a consumer's sustainability, ethics, equity, and dining for health values. Lang and Lemmerer (2019) found that consumers prefer such locally sourced foods because they believe that these foods are healthier and more nutritious, have a reduced environmental impact and carbon footprint, and allow them to support their community and the local economy. Furthermore, when consumers know their local food suppliers, information about equitable treatment and sustainable practices may be easier to obtain and evaluate.

A growing number of restaurants are highlighting the local farms that supply their food ingredients, giving consumers greater access to information that allows them to choose plant-based foods that align with the values expressed in the SEED framework. The National Restaurant Association reports that “66 percent of American consumers say they are more likely to visit a restaurant that offers locally sourced foods,” a trend influencing menu options, procurement practices, and marketing efforts (Fourth, 2022). Restaurants such as Chipotle are working with supply chain partners to ensure that the ingredients they source become food that is produced in ways that are environmentally sustainable and ethical. In Chipotle's 2020 sustainability report, “Cultivate a Better World,” CEO Brian Niccol notes that “sustainability is and always will be a strategic priority for Chipotle. I, along with the rest of the organization, strongly believe that how we grow our food is how we grow our future” (Chipotle, 2021).

Yet, as consumers move toward a plant-based diet, making food choices that align with multiple SEED values may create conflict, complicating food decisions. For example, consuming plant-based, low-calorie dairy substitutes such as almond milk may allow consumers to satisfy their healthy and ethical eating goals. Yet, almond milk consumption conflicts with consumers' sustainability values as almond production requires significant water and pesticide use, creating long-term negative effects on the environment (Fleischer, 2018). Consumers may employ different strategies in such food consumption contexts, at times highlighting a specific value by

prioritizing and making consumption decisions that align with that value while neglecting others (Fishbach & Dhar, 2005). Thus, in some instances, consumers may choose to consume almond milk, prioritizing health and ethics over sustainability. At other times, consumers will balance conflicting values by switching among the pursuit of these values over time (Fishbach & Dhar, 2005). For example, a consumer can balance their health, ethics, and sustainability values by drinking almond milk for breakfast and making a more sustainable food choice for lunch.

The interplay between the values included in the SEED framework is influenced by a complex array of individual factors (e.g., gender, affluence, education level, age, beliefs, taste preferences), psychological factors (e.g., moral maturity, confidence, locus of control, emotions, cognitive dissonance), and market factors (e.g., price, availability, quality, information) that can facilitate or impede food choices (Bray et al., 2011). Individual and market factors together may interact with values to impact plant-based eating. For example, income, an individual factor, and availability of healthy foods, a market/structural factor, can place plant-based diets out of reach for some families even though their values may align with the SEED framework. Research suggests that lower income families are often averse to purchasing plant-based foods because they anticipate food waste from unreceptive family members, particularly children (Daniel, 2016). Parents and families socialize children, influencing what they eat today but also shaping their future preferences. What policy and societal changes will level the playing field to give more families access to affordable plant-based options along with the equipment, knowledge, and skills to incorporate new foods into their family meals (Connell et al., 2017)? In addition, Block et al. (2011) describe cultural influences on food attitudes and beliefs. As one example, in some cultures, eating meat may signal maleness (Rozin et al., 2012), creating a potential barrier to plant-based eating. As eating patterns shift in such cultures, how do consumers navigate the transition toward plant-based eating?

Given the complexity of this food decision environment, consumers may benefit from guidance that assists them in understanding how their food choices align with their SEED values. For example, consider this: consumers misjudge the healthiness of sustainable foods. Hartmann et al. (2022) found that consumers perceived environmentally friendly foods such as tofu, falafel, and meat substitutes as less healthy than meat and cheese even though these foods' nutrient profiles suggested the exact opposite. Consumers who choose to prioritize dining for health over sustainability and ethics might therefore choose to consume red meat rather than a more sustainable food option (Kim & Yoon, 2021). Ultimately, such food decisions are neither beneficial to consumers' health nor protective of the environment, highlighting a

need for food labeling guidance that reduces consumer confusion. More research is needed to understand how food labels can encourage consumers to make value-based food choices that advance sustainability, ethics, equity, and health.

Another area of interplay between the values of sustainability and dining for health can be seen in the way consumers' sustainability concerns can impact portion control. Petit et al. (2020) found that concerns about potential food waste increased consumers' preference for smaller, as compared to larger, food packages. Yet, sustainability concerns may also detract from healthy eating by encouraging excessive consumption. For example, Ilyuk et al. (2019) found that consumers downplayed the unhealthiness of foods to justify consuming (rather than wasting) leftovers. In fact, recent work finds that food waste aversion is positively correlated with consumers' body mass index (Raghunathan & Chandrasekaran, 2021), suggesting a potentially detrimental effect of this expression of sustainability on consumption and health. Additionally, Block et al. (2022) outline psychological antecedents that lead to "consumer (mis)perception of food safety and (mis)estimation of food for consumption" that, in turn, increase food waste. Categorization of food as "bad," "spoiled," or "unsafe" based on freshness dating (Ransom, 2005; Wansink & Wright, 2006), the visual appearance of the product (Cooremans & Geuens, 2019), or damage to packaging (White et al., 2016) is often misinterpreted by consumers as a signal of food safety and thus increases consumers' propensity to waste food that could be safely consumed (Block et al., 2022; Neff et al., 2015; Wilson et al., 2017). Food waste, then, is not only an issue related to sustainability, but also to equity, ethics, and health given that people experiencing hunger could benefit from food that is wasted, and concerns about waste may lead to less healthy choices (Connell et al., 2017).

Research across multiple disciplines—including the environmental sciences, medicine, and nutrition—converges on the notion that plant-based diets are better for the environment, animal welfare, and human health (Fresan & Sabate, 2019; McEvoy et al., 2012). As consumers progress on their journey toward plant-based eating, they are likely to look for ways to integrate their SEED values into their food choices. For example, menu planning around seasonal foods may help consumers prioritize the use of local produce, a move that is sustainable, ethical, and healthy. Such planning is particularly helpful to consumers on a positive goal trajectory (Townsend & Liu, 2012). Furthermore, when consumers get off-track, positive self-thoughts related to their values can head off the negative downstream consequences that may occur when they fail to meet their goals (Townsend & Liu, 2012). More research should be devoted to examining how menu planning and other consumer tools assist people as they pursue plant-based eating.

DISCUSSION

In 2015, the U.S. Department of Agriculture's Dietary Guidelines Advisory Committee recommended that people eat less meat and more plants to benefit the health of both people and the planet. According to the committee's report, "A diet higher in plant-based foods, such as vegetables, fruits, whole grains, legumes, nuts, and seeds, and lower in calories and animal-based foods is more health promoting and is associated with less environmental impact than is the current U.S. diet" (USDA, 2015). At that time, this recommendation to eat a plant-based diet was not adopted as public policy and was largely ignored by individuals and organizations. Today, however, the increasingly devastating impact of the climate crisis, the urgent health crisis created by the COVID-19 pandemic, and the long-standing, systemic inequities brought to the foreground by the Black Lives Matter movement together are contributing to a shift in what people eat toward a plant-based diet.

In this review, which is rooted in the consumer psychology literature, we synthesize academic research exploring food and consumer values. Building on a report by the Rockefeller Foundation (2021) calling for a value-based societal food system, we grow a framework for understanding how and why consumer values—Sustainability, Ethics, Equity, and Dining for health—are transforming what people eat. We call our model the **SEED** framework. For environmental sustainability, social justice, ethical, and health reasons, people are embracing plant-based eating; by doing so, they are creating a "plant-based tsunami" (Severson, 2021). Plant-based eating is expected to continue to transform how we eat in the future, particularly because of "Gen Z, whose members want food with sustainable ingredients and a strong cultural back story, prepared without exploitation and delivered in a carbon-neutral way" (Severson, 2021).

How do such large-scale, systemic shifts in what people eat occur? One way is through the efforts of consumers. Social movements are often initiated by a small group of people—upstanders—who organize around shared values, gradually growing their efforts into larger campaigns that create meaningful change in the marketplace (Nardini et al., 2021). As these social movements evolve from localized consumer efforts to create waves of social change, they not only influence what a single person eats; they also influence and shift the food behaviors of others around them, ultimately transforming societal food consumption. That is because the attitudes and actions of others play a large role in how people make their consumption decisions (Zhang et al., 2021). Learning that others are taking action can inspire more consumers to follow suit. For example, reading about the growing number of people reducing their meat intake doubled the chance that research participants ordered a meatless option for lunch (Sparkman & Walton, 2017).

Furthermore, consumers who already engage in a behavior can be effective at promoting the same behavior. For example, a field study that involved 1.4 million US residents found that people who had purchased solar panels were 63% more successful at convincing other people to do the same as compared to those who did not own solar panels (Kraft-Todd et al., 2018). However, such social influence may not always be successful. Consumers may reject unsolicited advice or recommendations that are not consistent with their own preferences, resulting in behavioral backlash such as intentionally contradicting the advice (Fitzsimons & Lehmann, 2004). Such reactant behavior may manifest more prominently among consumers who are not committed to value-based consumption (i.e., having low-attitude certainty) as an assertion of independence (Mourali & Yang, 2013). More research is needed to further explore how social influence impacts plant-based eating.

Implications of the SEED framework for public policy and practice

Nutrition security

Every 5 years, the U.S. Department of Health and Human Services (HHS) publishes updated dietary guidelines—based on the latest nutritional science—to guide consumers, health professionals, and policymakers on how best to eat to promote health and prevent disease. The current 2020–2025 guidelines encourage Americans to choose low-fat dairy and lean sources of protein such as lean meat, poultry, eggs, and seafood. Although these guidelines mention plant-based alternatives to meat and dairy such as beans, nuts, and soy products, they continue to recommend and focus on meat and dairy as the central and most important sources of protein and nutrition. In spring 2022, HHS opened a dialogue seeking public comment to guide scientific inquiry into the development of the 2025–2030 dietary guidelines, presenting an opportunity to influence dietary policy to reflect the transition to plant-based eating. We call on policymakers to leverage the science on healthy eating to encourage wider adoption of plant-based diets in these 2025–2030 dietary guidelines. In addition, the 2025–2030 dietary guidelines should incorporate values such as sustainability, ethics, and equity into its recommendations, taking into account the link between the food consumers eat and the health of all people, our communities, and our environment.

In 2022, the USDA announced a stronger "commitment to advancing nutrition security, and the consistent access to safe, nutritious food that supports optimal health and well-being for all Americans" (USDA, 2022). Converting this policy goal into action will require equitable and affordable access to plant-based foods, programs that address food literacy, and the elimination of

barriers to healthy eating such as lack of refrigeration for safe food storage. Finally, to further shift the purchasing power of consumers toward plant-based eating and nudge consumers to adopt a plant-based diet, policymakers should increase federal subsidies for fresh fruits and vegetables and decrease subsidies for meat and dairy products as well as the associated feedstock crops required for meat production.

Sustainability certifications

Increasingly, food industry certifications—such as those issued by organizations such as Fair Trade USA, Rainforest Alliance, and Marine Stewardship Council—are emerging as a way to help consumers choose foods that align with their values, particularly with respect to sustainability. However, these certification credentials may create additional complexity and confusion for consumers. For example, if a consumer wants to focus on fair labor practices in food decisions, there are a variety of efforts (e.g., Fair Trade USA, World Fair Trade Organization, Fair Trade Federation, Fairtrade America, Fair for Life, and Worldwide Responsible Accredited Production) across the globe that address this concern. However, although all focus on social issues and equity regarding the production of goods and services, each uses different criteria and benchmarks for awarding certification, with many of these certifications focusing on specific industries or regions of the world. Still, the sheer number of different certifications makes it difficult for consumers to keep track of what each individual certification actually means, how they differ, and the rigor of the criteria used in determining certification. Furthermore, such certification systems, which are binary (i.e., documenting a product as either “certified” or “not certified”), do not provide consumers with the information needed to evaluate relative performance among options featuring the same certification. Indeed, policymakers may need to intervene as the efforts to create socially conscious labeling continues to grow, further complicating consumers' attempts to understand and navigate the increasingly confusing world of ecolabeling. Finally, it is critical to consider how best to move toward a more simplistic, summative labeling system to help consumers evaluate products across multiple dimensions of sustainability, ethics, equity, and health to empower them to make food choices that align with their values. These and other future research questions remain to be investigated.

Taxes, subsidies, and economic incentives

Market mechanisms that drive consumer behavior can be used to nudge consumers toward foods that advance the well-being of individuals, communities, and the

environment. Taxes, subsidies, and economic incentives to modify food consumption can change consumer behavior (Mozaffarian et al., 2012). This research finds subsidies to lower the price of healthy fruits and vegetables increase consumption and health outcomes. It also reveals that “small taxes would have little effect on consumption of less healthy foods or beverages. ... larger price increases appear to be more effective at altering consumption” (Mozaffarian et al., 2012, p. 1526). Another study determined that “prevailing prices do not reflect the true societal costs of foods” with respect to public health, concluding that a “combined tax and subsidy ranging from 10 to 30% would have a meaningful influence on dietary choices (Mozaffarian et al., 2014, p. 889).

In 2022, meat prices are rising faster than prices of other foods, shifting what consumers purchase and encouraging substitutions (Casey, 2022). Consumers responded by incorporating less beef and pork in their families' diets and relying instead on more cost-effective options. What is the tipping point that will create a long-term, plant-based change in the diets of consumers? Future research should investigate how to leverage price changes (perhaps using a combination of taxes and subsidies together with market forces) that favor a shift toward greater consumption of healthy, sustainable, and ethical plant-based food.

In March 1973, consumers engaged in a weeklong, nationwide boycott of meat in response to rising meat prices that ended with a call for consumers to abstain from meat on Tuesdays and Thursdays (McFadden, 1973). Research on such collective action describes how upstanders—people who take action—play a pivotal role in creating social change (Nardini et al., 2021). How could consumers spark collective action to boycott products that violate their values-based eating efforts or promote plant-based diets that align with SEED values? How do negative campaigns (boycotts/protests) work in concert with positive promotion to shift dietary patterns? Social marketing campaigns that promote plant-based eating by publishing recipes or create challenges that stimulate consumers to participate in dietary shifts (e.g., meatless Monday) could help consumers adapt their diets in ways that advance their health, are more sustainable, and also save money.

Directions for the future

The SEED framework is designed to be generative and to broaden research in consumer psychology and marketing. Table 1 suggests many possibilities for future research organized by the values highlighted in the SEED framework and separated into two categories: (1) future research that examines food decisions at the intersection of SEED values and (2) future research to investigate consumer dietary changes toward plant-based

TABLE 1 Future research

	Future research on values-based eating	Future research on plant-based eating
Sustainability		
Gap Between Attitude and Behavior	<ul style="list-style-type: none"> What forms of informational/educational messaging help consumers understand the connections between food choices and climate change? Using the “SHIFT framework,” which elements are most effective at converting pro-environmental attitudes into behavior change, positively affecting food choices? 	<ul style="list-style-type: none"> How much do consumers understand about the connection between meat production and climate change? What are the best methods to close the knowledge gap, shift attitudes and behaviors? How might this SHIFT framework target specific (vs. general) sustainable behaviors such as adopting plant-based diets?
Sustainability Goals and Trade-Offs	<ul style="list-style-type: none"> How might framing goals differently afford complimentary actions that advance multiple goals simultaneously rather than create goal conflict? What information systems or labeling standards can help consumers navigate trade-offs at the intersection of SEED values framework? 	<ul style="list-style-type: none"> What policy actions are needed to create incentives to eat sustainable and remove cost barriers to shifting to a plant-based diet? How do consumers evaluate and weigh different elements of sustainability when considering the cost of their food? (e.g., transportation vs. production)
Sustainability Values	<ul style="list-style-type: none"> How might customizing altruistic, biospheric, and/or egoistic messages toward consumers with independent vs. interdependent self-concept, toward individualist vs. collectivist cultural frames alter behavior and food choices? How do sustainability values form? What can we learn about value formation that helps develop strategies for promoting better integration of values within the SEED framework and promoting sustainable food choices? 	<ul style="list-style-type: none"> For consumers that choose plant-based diets for reasons other than sustainability, how can we leverage dietary preferences to encourage/reinforce other sustainability values? What is the intersection between cultural or religious preferences for plant-based diets and other dimensions of sustainability values?
Perceptions of Sustainability	<ul style="list-style-type: none"> What can we learn from “sustainability liability” beliefs other product contexts to counter this association for sustainable food choices? What can we learn from transferring positive attributes across dimensions of the SEED framework to promote other sustainable choices? What are the unintended consequences of promoting sustainable food choices? How do we ensure equity in sustainable food access within developed nations and on a global scale? 	<ul style="list-style-type: none"> How might positive or negative associations with plant-based diets (vs. meat-inclusive diets) influence (or deter) other consumers from adopting similar diets? How might trends toward plant-based diets create unintended consequences that impact access, by raising demand and/or prices associated with trendy diet patterns?
Affect and Knowledge	<ul style="list-style-type: none"> How do we promote sustainable choices in ways that build life-long habits but minimize licensing and negative outcomes that improve behavior along one domain but undermine other dimensions? What can the research on stages of change, nudges, and other psychological phenomenon teach us about stepwise actions to promote positive change and avoid all or nothing thinking? 	<ul style="list-style-type: none"> How do approach vs. avoidance messaging work differently to encourage the adoption of plant-based diets? Which are more effective in creating long-term change and why? What are the unintended consequences of efforts evoke emotion by humanizing (anthropomorphizing) animals in an effort to shift toward plant-based diets?
Ethics		
Navigating Ethical Dilemmas	<ul style="list-style-type: none"> How are social issues surrounding our food choices (i.e., climate, social justice, equity of food access) weighed against individual choices (taste preferences, health, resource cost) as consumers increasingly consider ethical issues when deciding what to eat? What are the differences in how people weigh ethical issues for self vs. others when they feed their family? 	<ul style="list-style-type: none"> When people move toward plant-based diets for ethical reasons, does it increase consumption guilt when/if they occasionally eat meat? How does added guilt backfire, discouraging diets that reduce meat and animal product consumption? When do trade-offs for more sustainable food choices (e.g., smaller animals and fish vs. consumption of larger animals) actually inhibit progress toward a plant-based diet?

(Continues)

TABLE 1 (Continued)

	Future research on values-based eating	Future research on plant-based eating
Justifying Ethical Violations	<ul style="list-style-type: none"> What can we learn about psychological process that both empower but also sometimes undermine ethical choices as consumers navigate an increasingly complex food environment? How can information or labeling about food production (e.g., sustainability impact, animal treatment, equity issues surrounding migrant labor) help consumers understand more fully the ethical issues associated with our food systems? How might this negative information backfire? 	<ul style="list-style-type: none"> What are the best ways to discourage all-or-nothing thinking when promoting plant-based diets for ethical reasons? How do moral cleansing and moral licensing help or hinder consumers as they pursue their plant-based eating goals? What are the limits of with-in vs. extended domain of sustainability when considering how licensing and moral cleansing behaviors alter future consumption?
Reconciling Culture and Identity	<ul style="list-style-type: none"> How will consumers navigate the growing awareness of ethical issues related to food when it conflicts with traditions and practices associated with culture and religion? What are the opportunities for food to unite rather than divide people? How can sharing food practices and a meal promote understanding and acceptance? 	<ul style="list-style-type: none"> Does leveraging existing beliefs and faith practices to promote plant-based diets create negative associations (e.g., co-opting cultural) in ways that offend consumers or can it be a stepping-stone to promote ethical and sustainable eating? What are the best ways to preserve culture and tradition but promote more sustainable, plant-based diets?
Equity		
Food Production	<ul style="list-style-type: none"> What is the changing role of policies to support more equity of profits and subsidies along the food chain? What can lessons learned from the pandemic teach us about the value “essential workers” within the food production system who provide access to the food a nation needs? 	<ul style="list-style-type: none"> How might promotion of plant-based diets exacerbate disparities for lower-wage, food industry workers via increased consumer demand? How might a larger societal shift toward plant-based diets serve as a platform to promote equitable work environments and food access?
Healthy Food Access	<ul style="list-style-type: none"> What are the similarities and differences in resolving issues of affordable access in urban vs. rural food deserts? What are the unique needs of different demographic groups? How can we resolve power differences in efforts to encourage support (financial, ideological, volunteerism) of local efforts to create affordable food access? 	<ul style="list-style-type: none"> How might community gardens and urban gardening initiatives increase affordable access to fresh and healthy foods within food deserts? What innovative programs could make fresh and healthy foods more readily available to our most vulnerable citizens, seniors but also children, who struggle with access especially to nutritious, plant-based foods?
Affordable Food Access	<ul style="list-style-type: none"> Which forms of healthy food access subsidies or incentives work best? How should incentives be distributed (e.g., growers, distributors and retailers, consumers) to equalize access? Beyond availability, what other structural of infrastructure barriers need to be addressed (e.g., transportation, neighborhood safety, housing, retail access, etc.) to increase food access? 	<ul style="list-style-type: none"> How can we leverage policies tied to industry funding (e.g., the Farm Bill) to encourage equitable, affordable access to the foods needed to support a plant-based diets? How can innovative programs designed to make fresh produce available in non-traditional food retail environments be expanded or shared to help more food desert communities increase access to fresh produce?
Food Marketing	<ul style="list-style-type: none"> What policy efforts best protect groups disproportionately targeted with food advertising? What marketing efforts can increase adoption of healthy and sustainable plant-based foods? 	<ul style="list-style-type: none"> Do consumers understand the impact of their food choices on social justice issues? How can marketing increase consumer demand for plant-based foods start to change dietary habits and help counteract health disparities?
Food Literacy	<ul style="list-style-type: none"> Within shifting educational focus on STEAM (Science, Technology, Engineering, Arts, Math) knowledge and skills, how can education efforts increase food literacy in ways that encourage healthy, sustainable diets? How can food literacy be integrated into other subjects? How do we address food literacy gaps in adults to prepare them with the knowledge and skills to prepare and consume healthy and sustainable foods? How do we integrate other eating values (sustainability, ethics, equity) into food literacy programs more broadly, especially in communities that currently lack sufficient education in these areas? 	<ul style="list-style-type: none"> How can we redesign school breakfast and school lunch programs to increase plant-based options and encourage students to try new foods at school? What policy and funding decisions are needed to make more plant-based menu items available at school but also palatable, enjoyable to children to maximize consumption and minimize waste?

TABLE 1 (Continued)

	Future research on values-based eating	Future research on plant-based eating
Access to Basic Services and Resources	<ul style="list-style-type: none"> What supplemental programs are needed best to support healthy food access (e.g., cooking equipment, utility support) in both chronic and episodic access situations? How should these programs be delivered to support equity in food access? 	<ul style="list-style-type: none"> As more food pantries work to provide access to fresh produce to support alternative diets, supply food to people with allergies and food intolerances, how might they also become a partner in expanding access to the equipment needed to safely store and prepare the foods they make available?
Dining for health		
Nutrition Information	<ul style="list-style-type: none"> Considering consumer confusion surrounding nutrition information, how do we increase information related to SEED values to empower choice without increasing confusion? What kinds of information best helps consumers navigate trade-offs in evaluating sustainable, ethical, equitable and healthy foods? 	<ul style="list-style-type: none"> What are the best strategies to promote healthy plant-based diets to increase sustainable eating? Since plant-based diets often incorporate more fresh produce (and adding packaging may reduce sustainability), what are the most effective ways to communicate nutrition information?
Heuristics and Judgment Biases	<ul style="list-style-type: none"> How can we overcome negative judgments associated with healthy options (e.g., less tasty, less filling) to promote sustainable, equitable, ethical, and healthy foods? What is the right balance of information vs. automatic influences to promote positive shifts? Which heuristics and judgments commonly researched to promote healthy choices transfer to other value-based dimensions (e.g., sustainability, ethics, equity)? 	<ul style="list-style-type: none"> What elements of food decision making in other behavior change contexts can be used to promote plant-based diets? Where are they similar, how are they different? How can public communication campaigns combat years of stored knowledge that may lead some consumers to consider plant-based diets as less healthy or inferior to meat-based diets?
Emotions	<ul style="list-style-type: none"> How might different SEED values be promoted to different audience segments in ways more likely to generate positive emotions for sustainable food choices? How do consumers navigate guilt and negative emotions when they violate their own eating values or are faced with difficult trade-offs? 	<ul style="list-style-type: none"> How might anticipatory regret be used to shift more consumers toward healthy, plant-based options and what are the risks of tapping into regret as a motivational force to change dietary patterns? What positive emotions best motivate a shift in a consumer eating habits to encourage sustainable diets?
Sensory Information	<ul style="list-style-type: none"> How can food marketing for value-based choices leverage promotional techniques that increase attention, interest, desire, and action or choice? While we have a good understanding of how sensory information influence food attitudes and preferences, what kinds of sensory information are important for understanding other value dimensions within the SEED framework? 	<ul style="list-style-type: none"> How might lower cost advertising on social media that focuses on rich imagery be used strategically to promote plant-based diets and encourage more consumers to eat sustainable, ethical, and equitable foods? What can producers and retailers learn from the marketing tactics of packaged and less healthy foods to promote foods without traditional packaging (e.g., fresh produce) at the point of purchase?
Social Influences	<ul style="list-style-type: none"> The “SHIFT framework” promoting sustainable consumption leverages the power of social influence, what research works best to encourage consumers to adopt value-based eating? What role do social media trends surrounding food consumption play in helping consumers increase awareness and adopt values-based food choices? 	<ul style="list-style-type: none"> When does positive peer pressure encourage behavior shift in this domain and when does it backfire, why? How can challenges that encourage short-term dietary shifts (e.g., no meat for a week, meatless Monday, or One-Meal-a-Day for the Planet) lead to lasting change toward sustainable and healthy diets?

eating. Here, we provide an overview of these directions as well as elaborate on several ideas for future research.

There is a significant body of research focused on helping consumers to make more informed decisions about their food to nudge them toward making healthy choices (Andrews et al., 2017; Bublitz et al., 2010; Wansink & Chandon, 2014). Many consumers are attuned to the health dimensions and impact of food, even if they do not always make healthy food choices. However, the values

driving food choices are evolving as consumers also consider additional questions about sustainability, ethics, equity, and health as they make food decisions. Future research should explore the complex interplay of these values on people's food choices. Consumer psychology in particular is equipped to investigate how consumers navigate increasingly complex value-based information as they make food choices and navigate the trade-offs they may face as these values conflict.

More research is needed examining how equity in the marketplace, as well as perceptions of equity, shape consumer food choices. How might we use policy and marketplace forces to incentivize food consumption that aligns with SEED values and limit or restrict foods that are less sustainable, healthy, or ethical? What are the most effective mechanisms to empower consumers to make value-based food decisions? Research has begun to address how consumers' concerns for and prioritization of disparities in equity impacts eating. For instance, we know that when selecting a food item, a person who is concerned about the treatment of farmworkers may favor products labeled "fair-trade" (Hiscox et al., 2011). How will consumers verify that food they consume was grown or made using sustainable practices and ethical treatment that promotes social justice? Furthermore, consider the fact that the production and distribution channel for many foods is vast, encompassing the farmers who grow the food, the intermediaries who process the food, and those who deliver the food to consumers. Research is needed to determine consumers' greatest concerns within food production and distribution channels, and which areas will maximize positive change at both an individual and societal level.

Beyond investigating the complexity of food decisions, as consumers consider the intersectionality of sustainability, ethics, equity, and health, movements to encourage more consumers to adopt plant-based diets should unite rather than divide us. The goal is not to pit the omnivores against the herbivores or vegans against the vegetarians. Rather, future research should investigate questions such as: Do these labels and identities help or inhibit consumers as they consider embracing plant-based diets? How do these labels affect social motivation to adopt plant-based eating?

Another vital area for research is the impact of social media on the transition to plant-based diets. Plant-based eating has gained ground on social media in recent years, with many influencers using their platforms to promote plant-based diets (Geyser, 2022). Yet, it remains unclear whether such social media efforts can inspire an actual shift in consumers' food choices. The limited research around this topic yields contradictory results: although some work suggests that social media influencers may play a role in encouraging other consumers to adopt ethical behavior (Zhang et al., 2021), other findings indicate that online word of mouth is not always effective at influencing consumers' attitudes and behaviors (de Oliveira Santini et al., 2020; Hennig-Thurau et al., 2015).

Future research should explore what impact social media content promoting plant-based eating has on consumers' food choices. This is particularly important for consumers who are not yet committed to plant-based eating. Extant research suggests that such consumers may feel threatened by the ethical behavior of others, which subsequently reduces their likelihood of engaging in ethical behavior (Zane et al., 2016). Consumers

may also choose to intentionally contradict advice that is not consistent with their preferences (Fitzsimons & Lehmann, 2004; Murali & Yang, 2013). Given such scenarios, future research should explore whether exposure to social media influencers promoting plant-based consumption results in behavioral backlash. Research is also needed investigating factors that can make consumers more receptive to social media content promoting plant-based eating: for example, what traits and qualities of influencers (Ki et al., 2022) and types of content (Li & Xie, 2020) might contribute to the success of such efforts? More research around this topic is crucial because Gen Z consumers, who constitute the most active demographic on social media (Barnhart, 2022), are also primary drivers of the shift toward plant-based eating (Jed, 2018).

Conclusion

The shift toward plant-based eating is growing. In the SEED framework, we explore the consumer values that underlie this shift: sustainability, ethics, equity, and dining for health. By adopting plant-based eating, we, as consumers, are taking action to benefit our own health and the health of our planet. In doing so, we express values that benefit ourselves as individuals, our society, and the environment. We act in a way that recognizes this fundamental truth: "Our individual flourishing is bound up in collective well-being" (Sreedhar & Gopal, 2021). We seed our individual and collective future and the future of our planet with plant-based eating.

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