Big Food Waste:
Discourses Institutionalizing Food Waste & the Alternatives
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Introduction

In the past decade, social consciousness and media coverage around the issue of "food waste"[1] have exploded. In a 2015 United States-based survey, 43% of respondents indicated that in the past year they had "seen or heard information about wasted food" (Neff, Spiker, & Truant, 2015). It is estimated that around a third of the food produced in the world is wasted (Gustavsson, Cederberg, & Sonesson, 2011). Food waste is often linked to other issues including food insecurity, environmental degradation, climate change, economic losses throughout the supply chain, and increasing consumer alienation from food (Gunders & Bloom, 2017; Kummu et al., 2012). Industry, NGO, and government entities are increasingly taking on food waste, educating the public and pushing for change in the food industry. In the United States, prominent campaigns to reduce food wastes include the Natural Resource Defense Council's Save the Food awareness raising endeavor and the joint United States Department of Agriculture (USDA) and Environmental Protection Agency (EPA) U.S. Food Waste Challenge. Globally, food waste is strongly relevant to two of the United Nations Sustainable Development Goals (SDGs): End Hunger (SDG2) and Ensure Sustainable Consumption and Production Patterns (SDG12). Subsequently the Food and Agriculture Organization of the United Nations (FAO), is investing substantial resources into studying and reducing food waste in developing and developed nations ("Food Loss and Food Waste," n.d.).

In 2015, the EPA and the USDA jointly announced the goal to reduce food waste and loss in the United States by 50 percent by 2030 ("United States 2030 Food Loss and Waste Reduction Goal," 2016). In 2019, they announced the Winning on Food Waste Interagency Strategy with six priority areas: enhance coordination between the EPA, the USDA, and Food and Drug Administration (FDA); increase consumer education; enhance guidance and coordination on measurement on food waste; improve clarity and information on food labels, donation, and safety; collaborate with private industry to reduce waste across supply chain; and reduce food waste in federal agencies ("Winning on Reducing Food Waste Federal Interagency Strategy," 2019). Substantial time and money are being invested by the United States government, NGOs and industry into promoting solutions to the complex issue of food waste.

waste discourse in the United Kingdom determined that collective actors have framed the issue of food waste as one of distributed responsibility across all actors in the supply chain. Actors understand food waste as coming from, and in the context of, system-wide interactions. The analysis goes on to suggest the existence of a discursive hegemony where all relevant stakeholders generally agree on the framing of food waste (Welch, Swaffield, & Evans, 2018). A similar distribution of responsibility and discursive hegemony can be seen in the United States as food waste responsibility is attributed to and accepted by representatives of every food-related actor (United States. Congress. House. Committee on Agriculture, 2016).

[1] The definition and use of the term "food waste" are highly variable. Food waste can refer to any food that isn't used for human consumption, including foods used to feed animals, create energy, or produce compost. On the other hand, food waste can refer only to food that was disposed of in the landfill or incinerated. Furthermore, crops not harvested from farms can also be considered food waste. Due to the variable quality of these terms, and the use of sources using the terms in different ways, the terms will be used very generally in this paper and if a specific definition is being used it will be defined in that situation.

Furthermore, in the United States there is a widespread framing of food waste as an economic, social, and environmental problem (Mourad, 2016). The New York Times article "Food Waste is Becoming a Serious Economic and Environmental Issue, Report Says" contains messages representative of this widespread framing. The article begins with the statement, "with millions of households across the country struggling to have enough to eat, and millions of tons of food being tossed in the garbage, food waste is increasingly being seen as a serious environmental and economic issue." It continues with the statement that $162 billion worth of food in the U.S. is wasted, and that food waste is an environmental problem because food production is resource intensive and it breaks down into potent greenhouse gasses in the landfill (Nixon, 2017).

The principle aim of this paper is to assess and address the impacts and shortcomings of the contemporary food waste discourse in the United States. The paper proceeds as follows. The first section provides a brief overview of some of the main food waste influencers in the United States. In the following section, news articles, blog posts, and industry, government, and non-profit reports are used to reveal the current diagnostic, prognostic, and motivational framing in publicly accessible and promoted media (Snow & Benford, 1988). The paper then moves on to discuss the impact of this discourse on the food system – the institutionalization of food waste and the reinforcement of status-quo power relationships and other structural forces that promote food surplus and waste. The final section turns to a discussion on the structural causes of food waste and its associated discourse and provides ideas for the next steps in systems change.

Influencers in U.S. Food Waste

In the United States, some of the most vocal and active groups, which are also often cited as experts in media and other reports, are the National Resource Defense Council (NRDC), Rethink Food Waste Through Economics and Data (ReFED), the EPA, and the Food Waste Reduction Alliance (FWRA), a collaboration between the Grocery Manufacturers Association, the Food Marketing Institute, and the National Restaurant Association. Each of these groups are active voices on the issue and the following gives a short summary of their work and their goals which drive their individual methods of defining, measuring and addressing food waste.

The NRDC is an international environmental advocacy group with the overall mission to "safeguard the earth" ("NRDC - About Us," n.d.) that has taken on the issue of food waste as one of its areas of work. The goal of the NRDC's food waste work is to "make America's food system more efficient and less wasteful." It conducts research and publishes reports often cited in media. It provides technical support and information to businesses and governments to reduce or recycle food waste. It pushes for policy change, especially regarding the standardization of confusing date labels. Furthermore, the NRDC provides consumer education through its Save the Food campaign ("Food Waste," n.d.-a).

ReFED created *The Roadmap to Reduce U.S. Food Waste*, which incorporated economic analysis to create an action plan to reduce waste on a large scale. ReFED's mission is to use a "data-driven approach to move the food system from acting on instinct to insights to solve our national food waste problem." To achieve its goals it conducts research, collects and provides data, suggests solutions, advocates for food label standardization and the centralization of food waste policies, and hosts maps locating food waste policy and innovative companies tackling food waste in the United States ("ReFED | Rethink Food Waste," n.d.).

The EPA's overarching mission is to "protect human health and the environment" (US EPA, 2013). Its sustainable management of food division provides background information on food waste, loss, and excess and explains how reducing food waste saves money, helps people, and conserves resources. In an effort to encourage businesses to reduce their food waste, it runs the Food Recovery Challenge which encourages the measurement of food waste and the use of practices that can reduce it. It also provides tools for measuring, preventing, and diverting food waste. Importantly, it created and disseminates the EPA Food Recovery Hierarchy (see figure 1) which prioritizes the actions organizations can take to address food waste ("Sustainable Management of Food," n.d.). The most preferred method is source reduction, the reduction of surplus food generated,

followed by food donation to people, then food to animals, followed by food to industrial uses (i.e. food to energy), then composting, and finally, the least preferred option is landfilling or incineration. As seen in the next section, most businesses and U.S. local, state, and federal government agencies reference the Food Recovery Hierarchy in their food waste reduction planning and media.

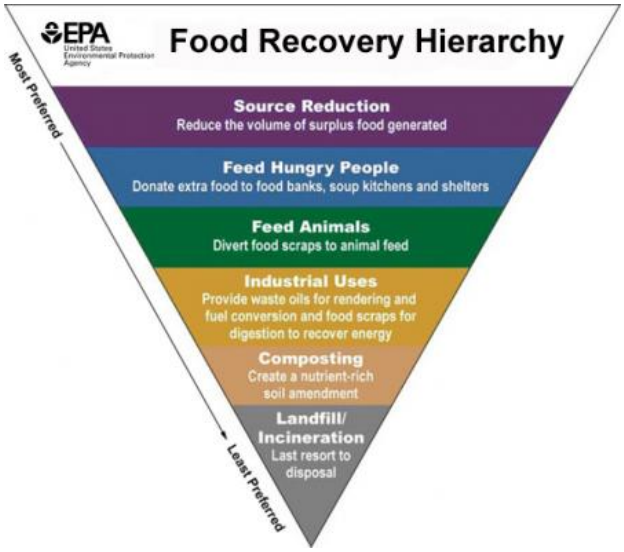

Figure 1 EPA Food Recovery Hierarchy. Source ("Food Recovery Hierarchy," 2015)

Finally, the FWRA's mission is "to reduce the volume of food waste sent to landfill by addressing the root causes of waste, and securing pathways to donate or recycle unavoidable food waste." The FWRA encourages food waste measurement among its members and publishes voluntary solutions and best practices for waste reduction. It also advocates for increased tax incentives for food donation, improved food donation liability protection, improved food recycling infrastructure, and increased public awareness of food waste ("Food Waste Reduction Alliance," n.d.).

Each of these organizations is working closely with collaborators, partners, and stakeholders in other areas of the food supply chain and their discourses and actions are subsequently moderate, in that they rarely, and only mildly, push actors to work against their economic interests. Their discourses remain well within the current frames of food waste as a problem of distributed responsibility and an economic, social, and environmental issue. Their solutions are uncontroversial and apolitical, with even the policy agendas, tax incentives and liability protection to increase donation, supported by most actors and the media. Furthermore, all of their proposed solutions fit well within our current system and even succeed in protecting "'profitable' forms of 'accumulation' from systemic critique" (Rogers, 2009; Wood, 2016), discussed further in subsequent sections. Notably missing among major influencers are consumer and farmer organizations. The following section dives deeper into the accepted causes of food waste and the related solutions for each of the prevalent identified food waste generators.

Overview of Contemporary Discourse

Production (farming), distribution and transportation, manufacturing and processing, food service, grocery and food retail, consumption, and government are some of the most referenced actors in food waste discourse ("Food Waste," n.d.-a; "Stakeholder Solutions," n.d.). Each sector generally takes responsibility for their portion of food waste. NGOs, manufacturers, food service, food retail, and government tend to propose solutions for everyone including producers, transporters and consumers. The following incorporates online media, government hearings, and reports to give an overview of food waste causes and solutions that are widely discussed and viewed as optimal in the current system (Mourad, 2016).

Production

The contemporary explanations for food waste on the farm include issues of overplanting, incomplete harvests, and cancelled orders post-harvest (Gunders & Bloom, 2017). Producers overplant to fully supply contracts in case of weather damage and to grow a sufficient quantity of crops matching buyer standards. Crop standards vary by buyer and include but are not limited to, size, shape and color (Plumer, 2012). Non-standard crops are not bought, and the producer has no incentive to harvest them. Furthermore, market factors such as low crop prices at harvest time, high labor costs, labor shortages, and food safety threats can increase the number of crops left on the field (United States. Congress. House. Committee on Agriculture, 2016). Additionally, buyers occasionally cancel orders and the producer might not be able to find another buyer before crops spoil.

The contemporary solutions to on-farm food waste include both supply-side and demand-side fixes. On the supply-side, innovations are being made in both market and weather forecasting technologies and data analytics that can help farmers better plan their plantings and marketing ("Gro Intelligence" n.d.). On the demand side, "ugly produce" organizations are marketing foods that don't meet traditional aesthetic or quality standards. They work directly with farms to create markets for their unbought produce. Imperfect Produce, a pioneering ugly produce company, reports that so far it has "saved" 40 million pounds of food, 1.2 billion gallons of water, and 110 million pounds of CO_2 and donated 2.2 million pounds of food ("Imperfect," n.d.). Furthermore, in a food waste hearing before the House of Representatives, a representative for the Produce marketing Association called for using breeding technologies to make crops more resilient to climate and transportation stresses, increasing research into crop resilience, and improving the availability of farmworkers (United States. Congress. House. Committee on Agriculture, 2016). If there are surplus foods and no market can be found, volunteers can harvest the leftovers, often referred to as gleaning, and donate food to food access organizations. According to the USDA toolkit on gleaning, gleaning simultaneously addresses the issues of food waste, surplus, and hunger (USDA, n.d.).

Distribution & Transportation

The specified reasons for food waste in transportation and distribution include improper handling of food, rejected shipments, and transportation delays (Gunders & Bloom, 2017; Plumer, 2012). Improper handling of food includes overhandling and deviations from proscribed temperatures. In order to address the problem of temperature deviations, sensor technology is being developed and implemented to track the conditions of food on the level of individual pallets. Food waste is specifically being used in marketing to sell these technologies as a blog-post from one sensor company states, "when food isn't stored properly, it leads to excessive amounts of food waste and lost income and other resources" ("The Benefits of Food Temperature Cold Chain Monitoring Sensors," n.d.). Furthermore, some of the same organizations marketing "ugly produce" are also recovering food from rejected shipments to market locally ("Rescued Produce," n.d.). Otherwise, when the foods cannot be sold in time, apps are being developed to connect drivers of rejected shipments with food access organizations so food can "feed the hungry instead of being dumped in the landfill" (Riva Ras, 2019).

Manufacturing and Processing

Manufacturing and processing operations vary widely and include operations from produce cleaning and packaging operations to consumer-packaged goods manufacturing. The reported main sources of excess and waste in these operations come from human error, production changes and the associated machinery cleaning, trimmings, process inefficiencies, and forecasting or machine errors that lead to surplus or unsaleable production (Gunders & Bloom, 2017; "Human error" 2019).

The. Solution to human error. Is staff training and standardized procedures. To improve process efficiencies and reduce waste, better forecasting software and other strategies such as Lean Six Sigma are recommended (Jachec, 2019). Foods that are usually wasted in the processing, such as trimmings can be "upcycled" into new foods such as juices. ReGrained, for example, takes spent grains from the brewing process to make a flour that is "healthy for you and the planet" and incorporated into all their final products (ReGrained, n.d.). For all those trimmings that aren't upcycled, most are "recycled" with a majority going to animal feed. Finally, finished but unsaleable product can be donated to "help feed hungry families" (Food Waste Reduction Alliance, 2015).

Food Service

Food service includes restaurants, catering, cafeterias, and school meal programs. Food service-related food waste tends to be split into pre-consumer and post-consumer food waste. Overproduction of foods, inventory mismanagement, poor handling, fluctuations in demand, and generally not measuring the amount of food waste are all common features promoting pre-consumer food waste (ReFED, 2018). Technologies and methodologies that help with food planning and waste measurement are some of the main solutions to pre-consumer food waste. For example, Leanpath, a food waste measurement and

analytics company, markets its technology as a way "to easily track food waste and immediately see the financial and environmental impact of that waste, educating staff on the spot" ("Take Control of Your Food Waste," n.d.). The Environmental Protection Agency (EPA) also runs the Food Recovery Challenge that provides businesses food management best practices, measuring tools, and donation education to address their food waste. By using EPA tools, food service organizations can "save money by reducing over-purchasing and disposal costs," "reduce environmental impacts," "support efforts to eliminate hunger," "increase tax benefits by donating food" and "support community waste reduction efforts" ("Tools for Preventing and Diverting Wasted Food," 2015).

The main factors promoting post-consumer food waste are large, inflexible portion sizes and consumer variability. Generally, portion sizes have been getting larger (Young & Nestle, 2002) and consumers often do not eat everything provided. The general advice to reduce portion-size related waste is to offer variable portion sizes and optional refills. For any food that is left over, food service organization should encourage the customer to take the leftovers with them. For the inevitable food waste associated with food service, the EPA hierarchy should be followed so that no food enters the landfill (ReFED, 2018).

Grocery & Food Retail

Food waste related to the grocery and food retail sector can be categorized into in-store losses and out-of-store influence and standards. Commonly listed reasons for in-store losses include excess food used to create a sense of abundance, disposing of foods as they near their date labels, high aesthetic standards, promotional or holiday products, and poor training and high turnover in staff (Jacobs, 2014). Grocery stores report that abundant displays increase sales, but they can lead to stocks in excess of what the store expects to sell. Furthermore, consumers will not buy foods that do not match their high standards including aesthetically appealing produce and food with ample time before the date on its label. When new products fail or when holidays are over, certain promotional products can be discarded. Additionally, poor staff training can lead to the mishandling or rushed handling of food. Staff shortages can make food repurposing, like using bruised foods in prepared food section, difficult (Gunders & Bloom, 2017).

Kroger stated in its 2018 corporate social responsibility report that it is addressing some of these in-store problems by measuring its food waste and working with "suppliers and customers to define new ways to display, package, and sell products so we can ensure edible food is not wasted in our stores, and to keep food fresh longer at home." With the food leftover that can't be sold, Kroger follows the EPA Food Recovery Hierarchy and first feeds people, then animals, or they "find industrial uses and composting options to avoid disposing of food waste in landfills" (Kroger, 2018). Walmart similarly "uses this hierarchy as a guide in our efforts to put food that might otherwise go to landfill to its highest and best use" because "all this waste poses a risk to the world's ability to feed a growing global population" (Wal-Mart Stores, Inc, 2016). The actions and goals of Walmart and Kroger are representative of those being taken by many other large and small food retailers. In the 2016 hearing on food waste before the house committee of agriculture, a representative for the FWRA stated that the its associated organizations were brought together around three goals "reduce food waste generated, increase food donated, and recycle unavoidable food waste" and went further to say that they had already begun succeeding in the process by collectively donating over 800 million pounds of food. In order to create a strong infrastructure for the recycling of food waste the FWRA also advocates for local, state, and federal action to improve anaerobic digestion and composting capacity (United States. Congress. House. Committee on Agriculture, 2016). Donations are usually communicated as either pounds donated or meals donated/provided.

It is generally accepted that the food retailers can influence food production and waste generation in other parts of the supply chain. For example, Walmart stated in its 2016 CSR report that it is working with farmers worldwide to improve agricultural productivity in order to feed the growing global population. It is also looking into encouraging consumers to reduce their food waste and provides an example of funding a study looking into motivating consumers to participate in food scrap recovery (Wal-Mart Stores, Inc, 2016). Additionally, one of Kroger's five priorities in the food waste section of

its CSR report is “Work with Farmers and Customers to Reduce Waste.” In order to reach that goal they are engaging with customers “through communications and product and service offerings to decrease [customer] food waste impacts at home and work” (Kroger, 2018). Retailers further engage with consumer food waste by spreading food preservation techniques, like Kroger’s Wilted to Wonderful series (Kroger, 2018). Furthermore, retailers, and the FWRA, are strong advocates for food label reforms and are “taking the lead on date labeling and reducing consumer confusion” (United States. Congress. House. Committee on Agriculture, 2016).

Other causes of out-of store food waste include cancelled orders, rigid contracts that motivate farmers to overplant, and high cosmetic standards (Gunders & Bloom, 2017). Though organizations such as Kroger mention working with farmers to reduce farm waste, it is unclear what they their plan or actions are (Kroger, 2018). Retailers could partner with farmers and share their forecasting data and productivity boosting techniques and knowledge, as the the Harvard Business Review recommends (Kor, Prabhu, & Esposito, 2017). For all the food left on farms after these collaborations, gleaning and imperfect produce organizations can help find a use for foods left on the farm.

Consumers

There is a general emphasis of consumer level food waste throughout the food waste discourse. Messages such as “consumers, as we know, are responsible for 44 percent of food waste in landfills. If we are going to make a serious dent, we need to help consumers” (United States. Congress. House. Committee on Agriculture, 2016) and “food is being wasted at an alarming rate. And we – consumers – are the largest source of it” (“Save The Food,” n.d.) are representative of a common consensus that consumers are collectively a major contributor to food waste.

Food waste at the consumer level is commonly attributed to the abundance of cheap food, alienation from food, poor planning, confusion around date labeling and associated concerns around food safety, and lack of consumer knowledge and skills (Gunders & Bloom, 2017; Milne, 2012). In The Atlantic Article “Why Americans Lead the World in Food Waste” the answer to the title is “calories are cheap and people are picky” (Chandler, 2016). The logic goes that Americans have become alienated from their food and now price is one of few remaining connectors between people and food. The lower the prices, the less guilt and thought associated with waste. Alienation has also led Americans to demand perfect, highly aesthetic foods and away from understanding that food is still good to eat when it is wilted, misshapen, or bruised (“How your shopping list could save the planet,” n.d.). These consumer standards then encourage grocery stores to have high standards that increase waste in the store and on farms (Goldenberg, 2016). Furthermore, many consumers don’t plan before shopping which leads to surplus provisioning and buying foods they already had. A Love Food Hate Waste article, “How Your Shopping List Could Save the Planet”, begins “do you make a shopping list before you go to the supermarket or your local shops? You’d be surprised at how many of us don’t” (“How your shopping list could save the planet,” n.d.). Finally, it is commonly reported that consumers are confused by date labels and according to a Johns Hopkins study 84% “at least occasionally” throw out food on or near the date on the label. Consumers are trusting date labels over their own senses, which are often adequate in determining the safety of food, due to rising societal concerns over food safety and mistrust of the food system (Milne, 2012). However, for most foods, the date label is not an indicator of safety and most post-dated foods are completely safe and nourishing (Povich, 2019).

Solutions to consumer food waste often include consumer education campaigns. The NRDC’s Save the Food campaign is a popular one used in many cities throughout the United States. The Save the Food Website website provides tools and tips to help people improve their food storage, plan meals, and plan for dinner with guests. The website informs viewers about the benefits of wasting less food including “shopping with a plan helps your wallet,” “using up leftovers helps the environment” and “being smart about food helps save water (lots of it.)” (“Did You Know,” n.d.). As mentioned earlier, grocery stores are also educating consumers about food waste and potential prevention and storage methods. Furthermore, many organizations, including the NRDC, FWRA, ReFED, and the EPA, are pushing for standardized date labels that say “best if

used by" in order to reduce consumer confusion ("Food Waste," n.d.; Food Waste Reduction Alliance, 2015; "Stakeholder Solutions," n.d.; "Sustainable Management of Food," n.d.).

State, Local & Federal Government

Local, state and federal governments are also taking on food waste. Recently, the 2018 Farm Bill was the first Farm Bill to include funding and programs directed towards food waste. The 2018 Farm Bill updates the Bill Emerson Good Samaritan Food Donation Act and allows some donors to donate directly to individuals instead of to non-profits (Sandson, 2018). Additionally, the Farm Bill creates a Food Loss and Waste Liaison position, updates TEFAP (a nutrition program) to improve capacity for gleaning projects, funds education about biogas (food to energy) systems, and mandates that the new Office of Urban Agriculture and Innovative Production work with municipalities to implement municipal pilot projects developing strategies for compost plans and food waste reduction. The Food Loss and Waste Liason will coordinate efforts between the U.S Food and Drug Administration, USDA, EPA, congress and state and local governments and conduct studies on food waste and raise awareness about food donation and liability protections (Kaufman, 2019).

At the state policy level, much attention is being paid to state organic waste bans (no organic waste to landfill) and waste recycling laws (requiring organic waste generators to compost or anaerobically digest organic waste). Connecticut, Massachusetts, Rhode Island, and Vermont have organic waste bans and California has a waste recycling law ("U.S. Food Waste Policy Finder," 2019). Furthermore, New York recently passed a statewide organics mandate that requires those that generate more than two tons per week to donate their excess edible food "for human consumption to the maximum extent practicable" (S. 1508 C, 2019). To which a senior attorney at the NRDC said "this is a triump for New Yorkers that will help fight climate change and food donation at the same time… it will also help reduce the massive amounts of unnecessary climate pollution, waste water, and lost money caused by good food going to waste" ("Crucial Bill" 2019). Select states are also implementing enhanced liability protection and tax incentives beyond the federal laws to further promote food donation ("U.S. Food Waste Policy Finder," 2019).

On the local level, many municipalities of various sizes are tackling food waste. Denver, for example, published the Denver Food Action Plan in 2018. The action plan sets forth goals a wide range of food related goals including the goal to reduce the amount of residential food waste in the city. In order to reduce food waste, Denver has set deliverables each year from 2018 to 2020 starting with wasted food prevention through consumer education, business engagement, and health inspector education. In 2019, it will deliver increased surplus food rescue through donation policy change, stakeholder engagement, and philanthropic investment. In 2020 it plans to deliver increased food scrap recycling through a sustainable plan for residential composting and commercial composting pilots (Denver Public Health and Environment, 2018). Many other cities including Austin, TX; Seattle, WA; Boulder, CO; Minneapolis, MN; New York, NY; Nashville, TN are working to reduce food waste food waste reduction initiatives, education, competitions, food waste bans/recycling laws and other practices (Berkenkamp & Hoover, 2017; "U.S. Food Waste Policy Finder," 2019).

Consequences of the Current Discourse

Most of the solutions or interventions covered above can be categorized into technological innovation, expanding markets, increasing efficiency, food donation, consumer education, and general diversion from landfill. All of the explanations and solutions for food waste hold some truth and most are used, presumably, in good faith with an earnest wish to reduce waste. However, it is argued here that this hegemonic discourse enables the status-quo and permits the system to continue producing food surpluses that will inevitably not be consumed by humans. The commonly stated causes of food waste partially address the complexity of the food system as they are tailored to each actor in the supply chain. Unfortunately, these factors do not address the systemic issues of uneven concentration of power, globalized supply chains, and unsustainable consumption that, discussed later, structurally promote food waste. The food waste discourse limits the imagination around and distracts from the true causes of a malfunctioning food system and the potential solutions or interventions necessary to truly

reduce food surplus and waste. For example, the word "waste" and the term "food waste" automatically create a set of associations with certain problems and solutions. "Waste" creates a sense of something that needs disposed of and dealt with instead of something to be utilized. Other terms such as "food surplus," the EPA's "sustainable materials management," or even "wasted food" change the perceived nature of the food and the associated problems and solutions (Frye & Fox, 2015).

Additionally, the discourse is leading to new food waste-based markets and the institutionalization of food waste. Food waste is increasingly institutionalized through growing partnerships between federal, state, and local governments with industry. One of the six priority areas in the Federal government's Winning on Food Waste Interagency Strategy is "collaborate with private industry to reduce food loss and waste across the supply chain" ("Winning on Reducing Food Waste Federal Interagency Strategy," 2019). Increasingly food waste related jobs are opening in industry, the government, and NGOs. Structures and institutions are being built around food waste, and there's the potential that these institutions won't want to work themselves out of relevancy.

The status-quo enforcing discourse promotes the creation of viable and sustainable markets for food waste solutions by promoting the collective understanding of food waste as an issue and identifying problems and solutions that garner goodwill and generate value without addressing the core issues (Humphreys, 2010). Technological innovation from sensors, forecasting, measurement hardware and software, data analytics, and packaging innovations, and expanding markets from the commoditization of waste, upcycling, and ugly produce have created markets where none had been before. The problematization of food waste and the valorization of food waste reduction have created new opportunities for marketing and profit. However, certain innovations, such as upcycled foods, could paradoxically worsen the sustainability of the food system by adding processing and inputs into foods that might be wasted further down the chain regardless. Some of these technological and market innovations undoubtedly produce beneficial economic, social, and environmental results for some actor, but advertisements of the of food, water, energy, etc saved do not take into account the foods that were subsequently not consumed due to the use or consumption of that product. Furthermore, even though many of these innovations might reduce demand for food, these solutions do not challenge the systems and power structures that enable food excess and waste. Any source reduction that follows these innovation are thus "weak" fixes that do not address structural causes of food waste and potentially do not serve to reduce any amount of food waste overall (Mourad, 2016).

Food donation is another contemporary solution that enables the status-quo not only in the food waste system but also in the food insecurity and hunger system. Similar to market innovations, food donation valorization does not address or question the systems that produced the donatable surplus in the first place. Furthermore, food donation garners goodwill for donators, most often grocery stores and manufacturers, who are also some of the powerful actors that promote food waste in other parts of the supply chain (Devin & Richards, 2018). Food donation, combined with efforts to educate farmers and consumers, allows these actors to claim responsibility for their portion of food waste, distract from their other food waste promoting activities, and gain praise for their efforts. Moreover, the phrase "meals donated" is often used in communications about food donation. According to Feeding America, meals are calculated using the conversion of 1.2 pounds of food per meal and does not represent anything regarding the quality or composition of meals ("The Impact of Dollars Donated" n.d.). There are often no regulations on the types of food accepted as donations and donations range from truckloads of ketchup packets to fresh local produce. Converting these unknown foods into "meals", a term that implies human consumption, serves to dehumanize the food insecure and diminish their perceived agency (Fisher, 2017). All the while, there is currently little, if any, investigation into the actual utilization of donated food. If there are large quantities of post-donation waste, it is unknown, and the additional resources used to carry out donation could create worse environmental outcomes. Finally, similar to the claims of environmental benefits from technological innovation and expanded markets, the claims of environmental benefits from food donation do not take into account the displaced consumption that could lead to increased food waste in other parts

of the food chain. Nor do the claims incorporate the resources used in the process of donating food, which could increase as food donation apps (Food Rescue US, n.d.) , for example, individualize and uber-ize food donation.

In addition to the status-quo reinforcing nature of food donation, food donations also support the status-quo in the anti-hunger arena through increasing agribussines influence on anti-hunger organizations and encouraging a system that "feeds the need" instead of "shortening the line." Providing free food to the food insecure solves the immediate problem of "hunger" but does not address the factors that create food insecurity in the first place. Moreover, anti-hunger organization's dependence on food and monetary donations from agribusiness erodes their ability to challenge agribusiness in their systemic promotion of food insecurity through low wages among other factors (Fisher, 2017).

Regarding consumer food waste explanations, most do an adequate job of determining many of the structural reasons for consumer food waste – alienation due to distance from food production; food label-related disposal due to food safety concerns and mistrust of food system; lack of storage, planning or cooking skills due to the process of deskilling; among others – however, the solutions to these problems often emphasize consumer behavior change over addressing these structural processes or ideologies. For example, education and date labeling standardization tend to be the most advocated interventions to address consumer food waste. Educating consumers about methods of food preservation, meal planning, and their food waste contributions can potentially decrease the amount of waste consumers generate; however, education does not address the reasons behind the societal shifts towards deskilling in the kitchen (e.g. the increasing female participation in the labor force, less perceived time for cooking, student dismissal of school cooking classes, etc) (Lyon, Colquhoun, & Alexander, 2003). Educational campaigns work to change food related values, from say expediency, to connection to food and environment. However, without addressing the core causes of behavior, educational efforts are bound to be largely ineffective (Holt, 2012). On the other hand, if consumers are motivated by the educational campaigns, the campaigns could further increase the demand for and value associated with consumer-facing food waste reduction markets like upcycled and imperfect foods. Moreover, a 2015 survey reported that when asked about their comparative food waste, 3% of respondents replied that they discarded more than the average American household and 73% responded that they discarded less (Neff et al., 2015). The majority that believe that they discard less than the average American could find educational campaigns irrelevant and have less food waste-related guilt.

Furthermore, grocery sponsored consumer education campaigns provide opportunities to associate brands with sustainability, gain further trust from households, and potentially distract from the other ways retailers encourage excess consumption (Welch et al., 2018). Since a majority of food retailers have margins of only one to three percent (Bean-Mellinger, 2018), they have a market incentive to encourage the sale of large quantities of food regardless of its final use. Examples of deliberate activities to increase sales include pricing and promotional activities, positioning foods that encourage impulse buying in strategic areas, and creating excitement to increase unplanned shopping (Dawson, 2013). Since retailers and food service organizations generate revenue from consumer purchases, they have a disincentive from truly reducing consumer food waste. The more food consumers waste, the more food they will buy to sustain their consumption patterns. There is subsequently no interpretation in the discourse of what would happen to food providers or actors up the food chain if consumers succeeded in substantially reducing their food waste. Thus, consumer-oriented solutions, like educational campaigns, distract from structural and intentional mechanisms that increase food purchases and stimulate household waste.

Prior analysis into food waste solutions has noted that, though the food recovery hierarchy is widely supported, recycling is commonly the first solution promoted by companies and municipalities (Mourad, 2016). This is in part because waste prevention is the most difficult to measure and visualize (Zorpas & Lasaridi, 2013). However, since the waste hierarchy prioritizes any use of food over disposal, it legitimizes and encourages *any* non-disposal measure. It enables organizations to use the intervention that is most convenient, or measures they are already implementing (increasing

efficiencies in grocery stores for example) and gain social goodwill for addressing food waste. Interpretations of the food recovery hierarchy that champion any form of diversion enable the status-quo and do not build an imagination for systems change. Mourad gets at the crux of the issue with her statement that, "the dominant visions of food waste and subsequent solutions generally focus on the management of existing surplus through recycling and recovery, overlooking long-term shifts toward sustainability that limit the creation of surplus" (2016).

Thus, the discourse surrounding food waste simultaneously reinforces itself while institutionalizing and creating markets out of concern over food waste. Markets and dependencies – food waste jobs, food donation, composting facilities, technological innovations and much more – are being formed around food waste. Brand marketing that uses food waste reduction, diversion or donation as a method of connecting brands to sustainability and social justice create value and goodwill while distracting from the structural promoters of food waste. These brands thus benefit from their connection to food waste and, by not addressing structural issues, sustain their market indefinitely. The discourse makes it seem as though major advancements are being made in the "fight against food waste," but the title of this Huffington Post article says it all: "The Fight Against Food Waste is Becoming Big Business" (Juul et al., 2018).

Expanding the Food Waste Discussion

The following is an attempt to expand the discourse surrounding food waste and add to the works of others (Bugge, Fevolden, & Klitkou, 2019; Diaz-Ruiz, Costa-Font, Lopez-i-Gelats, & Gil, 2018; Midgley, 2019; Mourad, 2016). This is not an exhaustive analysis of the possible promotors of food waste as the issue is pervasive and an aspect of much larger issues in contemporary socio-economic systems. It is argued here that both food waste and food waste discourse arise structurally out of the concentration of power in agribusiness, lengthy supply chains, agricultural exceptionalism and unsustainable consumption. Certainly, these are not the only factors promoting food waste and its discourse and this analysis is limited in its deconstruction of the structural causes behind these structural causes.

Agribusinesses have encouraged the systematic overproduction of food. They have campaigned against policies that would reduce supply in order to drive down prices and keep their input costs low (Murphy, 2008). Increasing concentration of power in agribusiness has caused a price squeeze on farmers as fewer companies control agricultural inputs and there are fewer buyers for agricultural products. Increasing costs and lower purchase prices have dramatically decreased farmer margins and increased pressure to expand production to survive ("Farm Household Income and Characteristics," 2019; Wies, 2011). Only those farms that are the most efficient and adopt new technologies thrive. Subsequently, great consolidation has occurred and continues in the agricultural sector (MacDonald, Korb, & Hoppe, 2013). Due to these market pressures to expand production and associated supply-promoting policies (Graddy-Lovelace & Diamond, 2017) the supply of calories in the U.S. has risen from around 3,000 calories per person per day to around 3,800 calories per person per day (Hall, Guo, Dore, & Chow, 2009). Furthermore, the concentration of power in agribusinesses grants a powerful voice in food waste discourse. The FWRA, the collaborative group of many agribusinesses, is found as a contributor and cited as an expert in a wide range of food waste media. Since other entities, such as the NRDC, ReFED, government entities, and Feeding America, wish to expand their impact, they work with agribusiness to exploit their influence in the food system. However, efforts at collaboration can diminish activism and structurally oriented solutions since agribusiness gain their wealth and power from the current structure. Changes that might be necessary to truly reduce food surplus and waste could increase costs to agribusiness and diminish their influence on the system.

Furthermore, long, industrialized and globalized supply chains increase the potential of food waste through increasing the impact of power asymmetries, expanding the range of influence of food safety issues, and further commoditizing food. Food regime analysis reveals trends in the consolidation and globalization of supply chains. A food regime is a "rule-governed structure of production and consumption of food on a world scale" (Friedmann,

1993). The current food regime, the "corporate food regime," represents further consolidation of supply chains with the standardized mass production of food and food products and greater agribusiness control of larger parts of the supply chain and larger quantities of food (McMichael, 2009). As agribusinesses control larger quantities of food, the power to reject food shipments or impose quality standards, for example, increases and farmers must comply to maintain their market. Furthermore, as more food goes through large-scale industrial manufacturing and processing, the control over food safety decreases and the quantity of food rendered waste by single instances of food contamination issues will increase (Stuart, 2008). Additionally, as supply chains lengthen, there are more middle-men between production and consumption that further promote the commoditization and fetishization of food. Each actor in the supply chain has the imperative to reduce costs, increase margins, and subsequently further squeeze farmers at the beginning of the chain. As supply chains lengthen and certain actors receive less of the food dollar, they might be incentivized to cut costs and reduce quality and food safety measures to improve their margins. With globalized food chains that currently have low traceability and transparency, actors that cut corners have plenty of places to hide (Marucheck, Greis, Mena, & Cai, 2011).

Agricultural exceptionalism, the notion that agriculture requires special protections and exemption from regulations due to its unique contribution to national and public interests (Luna, 1998; Schneider, 2010), could reinforce the current system of food overproduction and surplus. Agricultural exceptionalism can lead to the quieting of discourses detrimental to agricultural production practices. This process can be seen prominently in ag-gag and food libel laws, which criminalize various forms of communication that are harmful to the image of certain producers (Broad, 2016). Subsequently, the ideology and reasoning behind agricultural exceptionalism, that farmers should be exempted from discourse and policy influence, hinder the imagination around food waste and surplus solutions. Of course, farmers should be included in food waste, surplus, and sustainability discussions, but the sector should not be completely excluded from the potential structural solutions.

Finally, two gaps are apparent in the current discourse around consumer food waste. One is the separation of consumer food waste discourse from other forms of unsustainable food consumption. The other is the overall divorce of solutions for unsustainable consumption practices, including consumer food waste, from larger structural solutions. People do not make their food and food disposal decisions in a vacuum. They consider many characteristics including cost, taste, aesthetics, sustainability, personal and familial preference, health, safety, and many others. Food choice, waste, surplus, and health should be considered and addressed together, as similar structural forces encourage the unsustainable consumption in each arena, and they modify each other's relative environmental impact. For example, meat production requires much higher water, land, and fuel inputs than plant production (Poore & Nemecek, 2018). And meat production is spurred on and made cheaper by surplus production in grain and oilseeds (Wies, 2011). Both of which will undergo times of market volatility that will lead to oversupply and subsequent waste. Education about food waste, surplus, choice, and health might not engender change because it does not address deeper causes, however, the "cultural transformation of unsustainable markets" might. The following takes inspiration from Holt's analysis of the "ideological lock-in" – cultural mechanics, perceptions, and beliefs that reinforce certain ideologies – of the use of single-use plastic water bottles and the subsequent ineffectiveness of anti-single-use water bottle campaigns despite general support of the ethics fueling the campaigns (Holt, 2012). Holt postulates that single-use water bottles have remained an issue despite widespread knowledge of their environmental harms due to the convenience of bottled water, the belief that continuous hydration is healthful, the belief that filtered water is safer, routines around these beliefs, and a society that reinforces these beliefs. Thus, the way to address water bottle use is to create a market that fulfills these needs and beliefs without water bottles – highly accessible, convenient, public, filtered drinking and bottle refill states for example. Using this concept, one can work on creating a new market that creates more sustainable consumption in relation to food surplus, waste, choice and health if one addresses the ideologies that form these consumption behaviors. A subject matter for another paper.

Conclusion

The contemporary food waste discourse promotes the status-quo and lacks the structural focus necessary to substantially and sustainably reduce food waste in the United States and globally. Food waste institutionalization is occurring through the creation of jobs and government-NGO-industry partnerships working to *fight* food waste. Many entrepreneurs and innovators are creating and exploiting new markets for food waste solutions that unfortunately do not address the root, structural causes of food waste. Finally, the valorization of solutions such as donation and composting, that do not address the power structures and systems that promote food waste, create avenues for action that garner goodwill and reinforce systems of surplus and food insecurity.

The analysis in this paper suggests that consolidation of power in agribusiness, lengthening supply chains, agricultural exceptionalism, and unsustainable consumption are all factors creating food waste and its associated discourse. Entities that wish to address food waste are within the system that promotes it and subsequently must tend to the powers that drive it. Overall efforts are well-intentioned and will provide benefits, if short-term, to certain actors such as food recipients and entrepreneurs. However, political, controversial, and systemic discourse and action must come forth to make substantial change. Further research and discussion is necessary to develop new solutions to these complex, structural problems.

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