Big Portions, Big Profits: The Story of Oversized Portions and Food Waste in the American Restaurant Industry

A Research Paper submitted to the Department of Engineering and Society

Presented to the Faculty of the School of Engineering and Applied Science

University of Virginia • Charlottesville, Virginia

In Partial Fulfillment of the Requirements for the Degree

Bachelor of Science, School of Engineering

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Spring 2023

On my honor as a University Student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments

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Introduction

During my time working in the restaurant industry, I was consistently troubled by the amount of food waste left behind after a meal. As a sustainability student, I was familiar with the relationship between food waste and climate change: excess food rots and emits methane, a greenhouse gas, which then contributes to global warming. It made me uneasy to see how quickly uneaten food piled up and to think about how it would eventually sit in a landfill. At the same time, I couldn't imagine a scenario with any less waste because most customers were unable to finish their food. Most of our portions could not reasonably be finished in one sitting, at least not without eating well past fullness. Customers were essentially left with no choice but to waste a significant part of their meal.

Many nutritionists have partially attributed America's high obesity rates to "supersized" portions in fast food chains. Most people are well-aware of supersized portions in the context of fast food chains, but tend to overlook the fact that small restaurants can be just as guilty. A Tuft's study found that 92% of meals in U.S. restaurants ranging from small businesses to large chains exceed the recommended calorie content for a single meal (Urban et al., 2016). Serving excessive amounts of food essentially gives customers an ultimatum: eat too much, or throw it out. On one hand, when presented with more food, we are likely to eat past fullness due to psychological phenomena that influence our consumption behaviors. On the other hand, if people do not overeat, they leave behind copious amounts of food waste. It is a lose-lose situation.

Bigger portions allow restaurants to charge more for their food because they add value for the customer. Meanwhile, the restaurants may only increase expenses by a trivial amount if they are using cheap staples, particularly carbohydrates like rice, pasta, or potatoes. Take a pasta

dish for example: doubling the amount of pasta makes it reasonable, in the eyes of the customer, to pay twice as much. In reality, the additional cost to the restaurant may be only fifty cents (Jenkins, Page 1). Thus, larger portions typically yield larger profits.

In *Food Politics: How the Food Industry Influences Nutrition and Health*, Marion Nestle explains the economic motivations behind large portion sizes:

> From an industry standpoint, however, larger portions make good marketing sense. The cost of food is low relative to labor and other factors that add value. Large portions attract customers who flock to all-you-can-eat restaurants and order double-scoop ice cream cones because the relative prices discourage the choice of smaller portions. It does not require much mathematical skill to understand that the larger portions of McDonald's french fries are a better buy than the "small" when they are 40% cheaper per ounce (Nestle, 2013, Page 47).

After understanding the relationship between portions and profits, I was inspired to dig deeper. Why *is* it so profitable for restaurants to serve more in the U.S.? What exactly made food so cheap that the entire American restaurant industry is willing to let it go to waste like it is nothing? In this paper, I argue that the copious amount of food waste produced by the restaurant industry is a direct result of oversized portions, which can be traced back to agricultural policy and social trends of the 1970s.

This investigation will begin by reviewing the methods I used before delving into the results. The results are divided into two subsections: *Overabundance in the Food Industry* and *Impacts of Oversized Portions on Public Health and Sustainability*. I synthesize these results and discuss several examples of restaurants that have successfully taken measures to reduce food

waste or manage portions in the analysis section. In the discussion section, I outline an experimental design for a study on which measures are most effective at minimizing food waste in the restaurant industry. This experiment is meant to demonstrate an example of what next steps should be taken. At the conclusion of my paper, I summarize my recommendations.

Methods

Throughout my research, I used literature reviews across multiple disciplines, including nutrition, policy, history, psychology, and neuroscience. This paper draws on ideas from books, documentaries, scientific articles, and news articles.

I used actor-network theory to understand how certain events and trends are connected. The actor-network theory STS framework analyzes the relationships between various "human actors" and "natural phenomena" in a given system in order to understand what factors influence each other (Bijker, 2012, Page XLII). Actor-network theory is particularly fitting for my research because some of the major players in this topic are not human; they are processes, abstract ideas, and technologies. The most important non-human actors in my analysis are the psychological phenomena that cause overeating, the health conditions that result, the economic motivations behind making food portions oversized, agricultural technologies and policies that allow for maximum production, and the food itself. Another important part of actor-network theory is discovering where power flows across a network. For example, restaurant owners have the potential to positively impact public health and sustainability by adjusting portion sizes or offering various size options, but many still choose not to. Analyzing motivations and seeing how power flows using actor-network theory has allowed me to gain insight as to why that is. I used conceptual maps to visualize relationships between different actors in the system. Below, I

display a visualization I created to theorize which phenomena contributed to the growth of portion sizes (Figure 1).

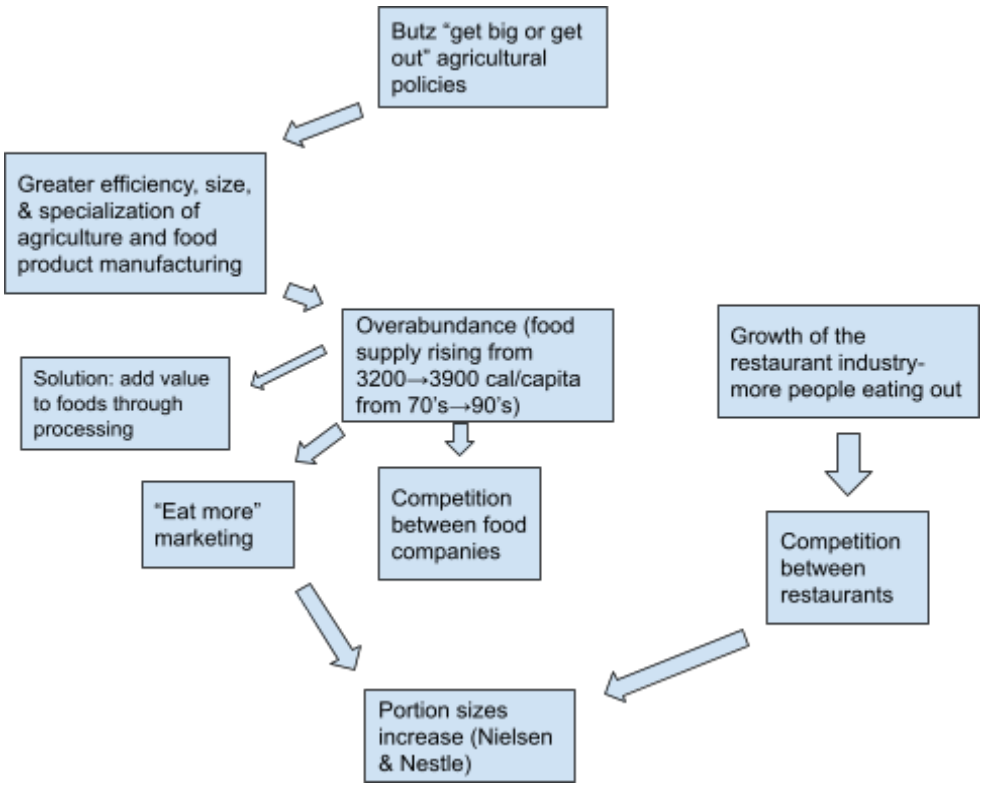

Figure 1. Example of a conceptual map used to examine relationships between various actors in a network.

Relevant social groups for this topic include restaurant diners, restaurant owners, chefs, corporate management of chain restaurants, people with nutrition-related health conditions, agricultural policymakers, nutritionists, and consumer behavior psychologists. Each group is either directly impacted by oversized portions or has a unique perspective on them. Due to the limited scope of this project, I exclude several relevant stakeholders. For example, wholesale restaurant food supply companies like Sysco could be relevant because reducing portion sizes would also reduce demand for bulk supplies. However, I have chosen to leave these companies

out of my research because oversized portions are not meaningful to them. I have also excluded sustainability experts that work with restaurant chains to reduce their carbon footprint, policymakers who implement measures to prevent obesity, and landfill owners. Though these groups may have notable perspectives on food waste and public health, their impact on oversized portions is too distant to be considered in this analysis. Refining these social groups ensured that my research could delve deeper into the role of key players and prevented spreading too thin across a looser network of stakeholders.

Results

Overabundance in the Food Industry

Patterns and Trends in Food Portion Sizes, 1977 - 1998 is a fundamental study in the domain of oversized portions. This research concludes that portion sizes and energy intake have increased significantly from 1977 to 1998, with the greatest increases in consumption being at fast food establishments and in the home (Nielsen & Popkin, 2003). Lisa R. Young and Marion Nestle's study, *The Contribution of Expanding Portion Sizes to the U.S. Obesity Epidemic*, corroborates these findings. According to Young and Nestle, "the trend toward larger portion sizes began in the 1970s; portion sizes increased sharply in the 1980s and have continued to increase" (Young & Nestle, 2002, Page 247).

Knowing that portion sizes began to increase around 1970, it is necessary to explore the historical context of the food industry during this time. In this portion of my paper, I theorize that the overabundance of food caused by 1970s agricultural policies are largely responsible for this trend. A surplus of food, in turn, led to a culture that normalized waste. In *American Wasteland,* Jonathan Bloom points to two historical trends that set the stage for overabundance in the food

industry: “American excess fully arrived when chemical fertilizers and pesticides became commonplace after World War II. As use of these fertility boosters picked up in the 1950s, so did farm yields. And the average annual commercial fertilizer use for 1960-1969 was more than triple that used in 1930-1939. Earl Butz, U.S. Secretary of Agriculture from 1971 to 1976, steered the nation toward maximum production,” (Bloom, 2010, Page 67).

Earl Butz was appointed Secretary of Agriculture by President Nixon in 1971. Prices were rising due to the Vietnam War, and Butz had a vision to produce food cheaply by transforming agriculture from small farms into large-scale corporate production. His “get big or get out” motto advocated for fencerow-to-fencerow farming, which encourages producing as much as possible and maximizing land use (Boulding). Butz was particularly determined to maximize the production of corn. The industrialization of agriculture caused food to be produced at a faster rate than ever before. Butz’s policies resulted in surpluses to the extent that there was way more food than necessary to feed the population. Calories provided by the U.S. food supply increased from 3,200 per capita in 1970 to 3,900 in the late 1990s (Nestle, 2003, Page 29). That is double what is needed for women, 1 ⅓ times what is needed for men, and significantly more than what is needed for children (Nestle, 2003, Page 34).

With more than enough to go around, the food industry needed to find new ways to use up the surplus. Two strategies were particularly important for using excess crops: an increase in processed foods and marketing strategies to promote eating more. Both practices supported an increase in portion sizes. Bigger portions encouraged restaurant diners to eat more, while processed foods allowed kitchens to use frozen, packaged, or canned ingredients. Since processed foods are cheaper than fresh foods, restaurants could easily expand their profits by serving a larger portion. Although the quality that comes with serving fresh ingredients was

sacrificed, it was supplemented by larger quantities of food. With an increase in portion size, a higher price was justifiable for customers.

As Bloom points out in *American Wasteland,* overabundance in the food industry caused more casual attitudes towards food waste: "encouraging farmers to increase yield and sell the surplus overseas prompted the harmful culture surrounding food that persists today. The increased supply reduced prices, and increasingly, cheap food prompted the attitude that we didn't have to worry about waste. All of this contributed to a devaluing of food," (Bloom, 2010, Page 67).

During the 1970s, eating outside the home was also becoming increasingly popular (Bloom, 2010, Page 128). It is estimated that meals consumed outside the home comprised 34% of the food budget in 1970 compared to 47% by the late 1990s (Young & Nestle, 2002, Page 246). As the restaurant industry grew, competition between businesses arose. One way that restaurants could make themselves stand out was by adding value to their meals. Offering larger portions for comparable prices would attract more customers. By the 1990s, value became the customer priority (Bloom, 2010, Page 128).

Impacts of Oversized Portions on Public Health and Sustainability

Abnormally large portions are one of the main reasons for the United States' obesity problem. A video from Insider magazine comparing U.S. and U.K. fast food portions found alarming differences, with the U.S. size being double that of the U.K. in the case of KFC's large french fries (Avella, 2021). Such large portions are appealing to consumers because we see them as a bargain-- we get more food for less money. However, this mindset is flawed because we still pay for more than we need, regardless of whether we get a better bang for our buck. Consumers

may rationalize this by planning to save their leftovers for a second meal, but a phenomenon called the portion size effect makes it difficult to resist overeating. When presented with an excessive amount of food, restaurant diners experience "portion distortion." Instead of relying on body cues signaling fullness to tell them when to stop eating, they decide based on the amount of food they see on their plate (Wartenberg, 2022). Habitual overeating causes excessive energy intake, resulting in unwanted weight gain and risk of heart disease, obesity, and diabetes (Wartenberg, 2022).

Oversized portions cause restaurants to produce copious amounts of food waste, which typically goes to a landfill and contributes to climate change. According to the EPA, "when food goes to the landfill, it's similar to tying food in a plastic bag. The nutrients in the food never return to the soil. The wasted food rots and produces methane gas" (Environmental Protection Agency, 2022). Emissions from landfills contribute to climate change because methane is a greenhouse gas. In fact, the carbon footprint of U.S. food waste is greater than that of the airline industry (Kaplan, 2021). Alternatively, if restaurants halt harmful practices that lead to food waste, tremendous sustainability benefits become possible. Reducing portion sizes could divert 2.42 million tons of waste from landfills, reduce carbon dioxide emissions by 11.5 million metric tons, and save 578 billion gallons of water each year (ReFed).

Analysis

My research reveals an explicit connection between the policies and cultural trends of the 1970s and some of the most pressing public health and sustainability issues of the present. In the introduction of this paper, I highlighted that larger portions yield larger profits because some foods are cheap enough to add quantity without increasing costs significantly. My research on

agricultural expansion supports that the cheapness of food that allows restaurants to do this is possible because of Earl Butz's "get big or get out" policies.

The government and the food industry has a tremendous influence on our nutrition and health, and it is up to them to change how we eat and waste food. The concept of portion distortion proves that overeating is psychologically almost beyond our control. When tackling issues like obesity, heart disease, diabetes, and food waste, the burden should not be placed entirely on the customer to watch what they eat or only order what they want. That is certainly part of the problem, but the bulk of the solution needs to come from the businesses and institutions who control the available food options.

The biggest action restaurants can take towards minimizing food waste and overeating is offering more options. Allowing customizations and half portion sizes enables the customer to order only what they will eat. It is easy to tell people to manage their own portion control and waste less food, but this can only happen with the cooperation of restaurants. There are many establishments that have successfully implemented creative strategies for reducing food waste.

The most notable of these cases is T.G.I. Friday's *Right Portion, Right Price Menu*, which launched in 2007. The menu featured smaller portions for lower prices-- specifically, dishes were approximately 30% smaller than the original, and prices were about 33% less (Patel, 2007). After analyzing survey results on customer needs, the restaurant chain found that half of their customers thought the portions were too large. Offering various portion options allowed T.G.I. Friday's to satisfy customers who responded either way. The *Right Portion, Right Price* menu was wildly successful, resulting in a 4% increase in customer visits and a 2.5% increase in sales from the same period of the previous year (Martin, 2007). T.G.I. Friday's success can partially be attributed to the fact that the only difference between the regular and the smaller

option was size as opposed to modifying the dish to be healthier. “Other restaurant chains have offered smaller portions, but they have not succeeded because the offerings were often relegated to a ‘lighter fare’ section of the menu or they were not much cheaper than full-size entrees. What makes Friday’s smaller portions different is that they are not necessarily healthy (ribs with fries is one ‘right size’ entree) and they are significantly cheaper than their full-size counterparts,” (Martin, 2007).

French restaurant Les Arcades takes this one step further by offering four size options on all of their dishes: small for an appetizer-sized portion, medium for half the size of the classic portion, large for the classic size, and extra-large for sharing or for big appetites. Offering customization of size has allowed the restaurant to reduce its food waste by 40% (Franceinfo, 2014). American restaurants should consider adopting similar practices for the benefit of the customer and as a means of reducing food waste.

The food service industry seems to be headed in the right direction. Options for smaller portions became increasingly popularized in the early 2010s. From 2009 to 2014, the number of small plates and smaller portion items on menus across the country increased by 32 percent (Gunders, 2012, Page 25). Other examples of American restaurant chains who successfully implemented smaller portion options are Eat’n Park and Au Bon Pain in 2008. Au Bon Pain’s “Portions” foodline included small plates with less than 200 calories and half sandwiches to allow customers to mix and match their size and flavors. The new menu line was created with the intention of increasing customer flexibility. “I’m against telling customers that this is what the portion is, and if you can’t eat it, pack it up or throw it away,” executive vice president of food and beverage Thomas John explains, “our main effort was to give that flexibility, that choice to the customer,” (Bloom, 2010, 132).

Alternatively, some restaurants have made the reduced portion the default for some dishes. This can be particularly effective in side dishes because much of the plate waste generated in restaurants comes from unwanted side dishes that come with a meal. Aaron French, owner of the Sunny Side Café in Berkeley, California, takes a unique approach to tackling food waste by cutting the portion size of his home fries, but allowing free refills (Bloom, 2010, Page 133). Such a system ensures that customers are still satisfied without serving too much food.

Though reduced portion options are one of the most effective ways to reduce plate waste in restaurants, many restaurant owners express concern about possibly decreased sales. However, there are many other avenues restaurants can take for waste mitigation without any risk of losing profit. One alternative is repurposing kitchen scraps leftover from meal prep in other dishes. For example, Aaron French of the Sunny Side Café uses leftover hamburger buns to make french toast the following morning (Bloom, 2010, Page 118). Similarly, Ellary's Greens in New York City serves a salmon burger made from the trimmings of its salmon filet entrée (Gunders, 2012, Page 25). Bodo's Bagels in Charlottesville also has a breakfast sandwich called the "Deli Egg Bagel", which uses its meat scraps to make an egg scramble (Bodo's Bagels).

Discussion

Further research is needed to understand which solutions are the most effective for reducing food waste. With the exception of Les Arcades, most of the restaurants who added a reduced portion option were motivated by health concerns about oversized portions. Most of the research thus focuses on health implications rather than sustainability implications. There is plenty of data available on the size of restaurant dishes and some estimates on the collective food waste across the entire restaurant industry. However, there is little to no data on how much plate waste is generated at individual restaurants because most establishments do not track their food

waste. In this portion of my paper, I propose a design for an experiment on food waste at restaurants with varying levels of portion customization options.

The following experiment aims to answer the question, how does customization of portion size and content impact plate waste generated at restaurants? The study will explore this question by collecting plate waste data at five types of restaurants: all-you-can-eat buffet style, restaurants that offer one reduced portion option and one "classic" option (i.e. T.G.I. Fridays), restaurants that offer multiple reduced portion options (i.e. Les Arcades), restaurants with a single option that qualifies as oversized, and restaurants with a single option that does not qualify as oversized. In the fourth and fifth types of restaurants, portions containing more than 830 calories are considered oversized. This cutoff is based on the typical daily energy requirement of 2,500 kilocalories per day for an adult man, or three meals of approximately 830 calories (Urban et al., 2016, Page 4). The study will analyze twenty restaurants of each type, for a total of 100 restaurants.

In this experiment, food waste at each restaurant will be discarded in a container separate from other types of waste. At the end of each day, the containers of waste will be weighed. Quantity of sales and revenue will also be recorded. The primary dependent variable of this study is the mass of waste generated, but sales will also be taken into account. Quantifying sales aims to address the question of whether smaller portion options reduce revenue, the primary concern of restaurant owners who are hesitant to implement a reduced portion option. The independent variable is restaurant type. Differences in the amount of daily plate waste and sales will be analyzed to determine which types of restaurants generate the lowest amount of waste without sacrificing profit.

This study would be an important step towards mitigating food waste in the restaurant industry, but much more research is needed. Studies analyzing the profitability of various waste minimization strategies would facilitate the adoption of strategies by restaurants. Many restaurants are hesitant to implement a reduced portion option because they are concerned that offering smaller portions could reduce revenue. Knowledge of which methods are most profitable will give restaurants the confidence to implement waste minimization strategies. Chain restaurants can also send out customer surveys to gauge opinions on portion sizes and adjust or diversify them accordingly.

I have outlined several actions that various stakeholders should take to mitigate food waste. First, agricultural policy must address the issue of overabundance and explore more efficient means of managing the food supply. Second, restaurants can experiment with various methods for reducing food waste. This may include offering multiple size options, repurposing kitchen scraps, or allowing customization of side dishes. Further research is needed to successfully promote the widespread adoption of these strategies. Studies on which waste minimization strategies are most profitable and effective will be particularly important. Finally, the best way to prevent food from going to waste is to stop buying too much of it in the first place. An overabundance of food has desensitized Americans to the sheer amount that we waste. Acknowledging how these behaviors impact the natural environment and challenging our "bigger is better" mindset can restore a conscious attitude towards food. When you go out to eat, avoid ordering dishes that you know you won't be able to finish, check your temptation to get the supersize if you are only interested because it's a good bargain, share plates, and ask for a to-go box when you have leftovers. Simply taking the time to think twice about portions is a subtle yet invaluable step towards sustainability, and it will save us a lot of money along the way!

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