Seshadri, A. (2025). Closing the Loop: Addressing Food Insecurity by Redistributing Supermarket Surplus. *Critical Debates in Humanities, Science and Global Justice*, *5*(1), 110–126. https://doi.org/10.68709/001c.130915

RESEARCH ARTICLES

Closing the Loop: Addressing Food Insecurity by Redistributing Supermarket Surplus

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https://doi.org/10.68709/001c.130915

Critical Debates in Humanities, Science and Global Justice

Vol. 5, Issue 1, 2025

Supermarket redlining refers to the practice where major chain supermarkets avoid opening stores in or relocate existing stores away from inner cities and low-income neighborhoods. Unlike historical redlining practices in housing, supermarket redlining is not illegal. However, its effects can significantly impact food security and public health in urban and low-income areas. Supermarket redlining amplifies food insecurity by creating food deserts—areas characterized by limited access to healthy and affordable food options. As a result, low-income neighborhoods often rely on cheaper, less nutritious alternatives, leading to higher rates of obesity, diabetes, and other diet-related health issues. Supermarket redlining and the resulting food insecurity is accompanied by billions of pounds of consumable food waste each year. While supermarkets do partner with food banks to distribute healthy unsaleable food, excess food is still wasted. A circular model in which wasted consumable food is recaptured by incentivizing supermarkets with a new revenue stream can reduce wasted consumable food, alleviate food insecurity and build a long-term solution to the redlining problem. The research below examines the relationship between supermarket redlining and food insecurity, evaluates the gaps in existing solutions, and proposes solutions that are scalable and sustainable. It concludes that adding circular model incentives to the existing food distribution system helps create a more just and food secure global community, but more work needs to be done in quantifying wasted consumable food, breaking the cycle of cost externalization, and finally addressing people's willingness to adopt healthier alternatives.

Introduction

According to the USDA's food access research report published in 2022, in the U.S., approximately 39 million people live in low-income and low-access areas, more than 1 mile (urban) or 10 miles (rural) from the nearest supermarket or large grocery store (The Annie Casey Foundation, 2024). Due to the reduced profitability of doing business in these areas, supermarkets often locate elsewhere - a practice referred to as Supermarket redlining.

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Consequently, poorer communities are either forced to pay higher prices for food at more expensive convenience stores located closer to their homes, or subsist on cheaper, unhealthy fast food alternatives.

In general, supermarkets generate profits by procuring retail products in bulk at lower prices and selling them to consumers at retail prices. Bulk foods typically have a 50% profit margin, compared to only 15-35% for pre-packaged items (Purcell, 2024). Buying in bulk allows for higher profits due to lower transportation and storage costs and reduced labor costs for stocking and managing inventory (Davis, 2023). When there is an option to buy in bulk, businesses can significantly enhance their profitability by reducing transportation and storage costs through fewer deliveries and more efficient use of space. Additionally, buying in bulk minimizes labor costs associated with inventory management by decreasing the frequency of restocking and simplifying order processing. These savings, combined with economies of scale from volume discounts, create a more streamlined operation that boosts overall financial performance.

To preserve these higher profits, large supermarket chains tend to locate their stores in high income areas where consumers are willing and able to afford the retail prices. Independent supermarkets tend to locate in areas that are not covered by such large supermarket chains. But their retail prices for products tend to be higher as they do not have the same economy of scale leverage that large supermarket chains have in procuring products in bulk at lower prices to maintain high profitability. Such one-off supermarkets tend to pay more for procurement and pass on those added costs to consumers, which raises the retail prices for these products.

Changes in food prices can significantly impact purchasing behavior. For example, low income consumers are generally more sensitive to food prices and tend to switch their purchases from healthier options to cheaper, less nutritious alternatives when the prices of healthy foods increase (U.S. Department of Health, 2024). When the price of one food item increases, it can affect the demand for other foods. These relationships are measured by cross-price elasticities, which can reveal substitution or complementary effects between different food categories. Consequently, low income consumers are forced to either pay higher prices for any healthy food available from the independent supermarkets located close to them or switch to lower priced unhealthy alternatives such as fast food on a regular basis.

Supermarket redlining exacerbates food insecurity by preventing healthy, nutritious foods from reaching those in need. As defined by the US Department of Agriculture (USDA), there are two levels of food insecurity: "Low Food Security," where individuals endure reduced quality, variety, or desirability of diet; and "Very Low Food Security," where people suffer from limited food budgets, skipped meals, and calorie-restricted diets, viewed as a more severe condition (Drewnowski, 2022).

Supermarkets waste billions of pounds of consumable food annually (SkipShapiro, 2023). While redistributing the wasted food to communities in need could alleviate their food insecurity, it is a challenging problem involving complex planning, logistics and time bound execution to ensure healthy consumable food makes its way to consumers that need it the most. Addressing the problem effectively needs a comprehensive approach that enables redlined communities to access healthier food at reasonable prices instead of resorting to cheaper alternatives.

Historical Context

The practice of supermarket redlining originated in the 1960s, borne out of a similar form of discrimination in the housing market three decades prior. Redlining originally started as a discriminatory practice developed in the 1930s U.S., following the Great Depression, when people relied upon loans in order to buy basic commodities such as housing and shelter. Banks received a surge of mortgage applications, but often gave much more favorable terms to White applicants (Mukherjee, 2020). Banks denied mortgages to people of color, usually in urban areas, thus preventing them from buying homes in certain neighborhoods. In order to differentiate between areas deemed more desirable and less desirable, banks used red ink to mark their paper maps to draw borders, hence the term "redlining" (FDR Library, 2024). As a result, Black families were priced out or "redlined" out of many urban neighborhoods. The spatial patterns created by 1930s redlining influenced later retail development, including supermarkets (Eisenhauer, 2001). The practice of "supermarket redlining" emerged as large grocery chains began locating stores in wealthy suburbs instead of inner cities or removing existing stores from lower-income urban neighborhoods. The pattern of retail development mirrored earlier residential redlining practices, with supermarkets focusing on serving more affluent suburban communities. In Los Angeles, for example, the suburbanization of grocery stores in the 1930s made them less accessible to Black residents due to restrictive covenants, redlining, and housing discrimination, showing a direct link between 1930s redlining and later food retail patterns (Shaker, Grineski, Collins, Flores, 2022)

Food insecurity is a significant public health issue, particularly in low-income and minority communities, which are disproportionately affected by redlining (Swope, Hernández, & Cushing, 2022). Historically redlined neighborhoods are more likely to have unhealthy retail food environments even when controlling for current economic and racial factors (Li, Yuan, 2022).

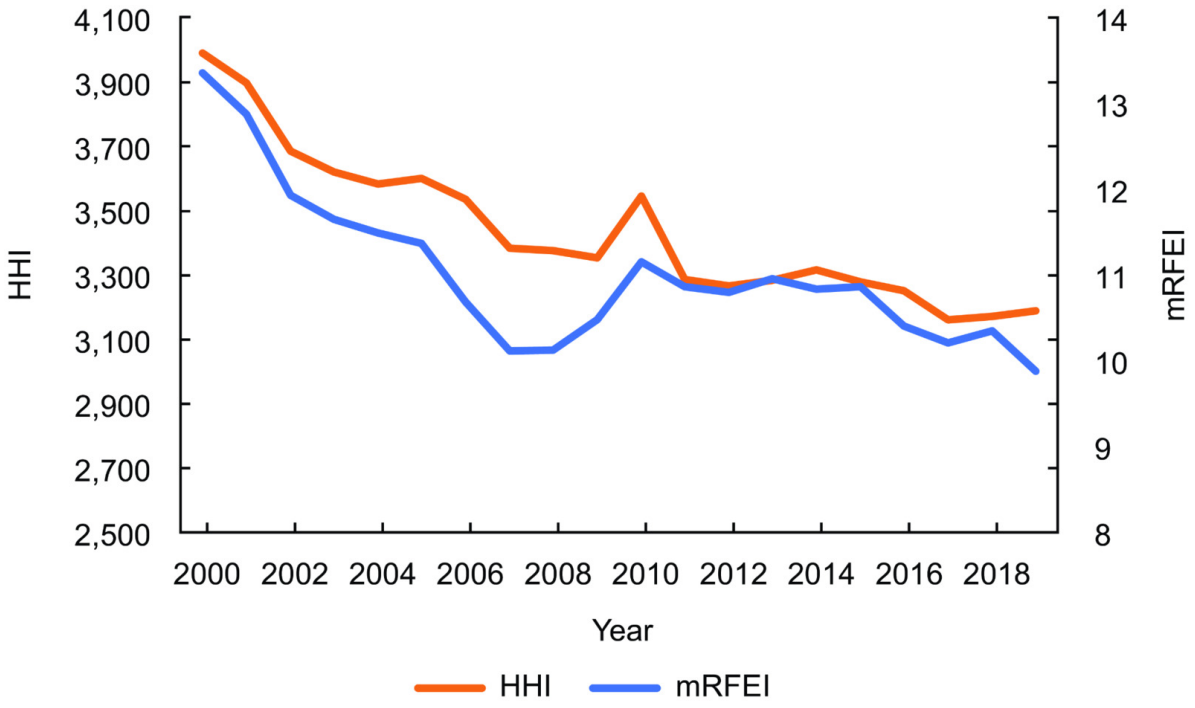


Fig 1. Household Income Per Month (HHI) Compared to Modified Retail Food Environment Index (mRFEI) between the years of 2000 and 2018 (Jiang, Ghosh, Steinbach, Stowers, 2023)

Figure 1 shows the relationship between monthly household income (HHI) and percentage of available food that is considered nutritious in a specific geographic area (mRFEI). The mRFEI is a score measuring the relative healthiness of a food environment, a continuum where we have limited access to healthy food (food desert) or higher availability of unhealthy food (food swamp) on the one end and higher availability and easy access to healthy food (food oasis) on the other end. In general, areas with smaller incomes have substantially less access to healthy food. The racial breakdown is even more stark, where members of marginalized communities, pushed into suburbs, suffer from increased limited access to healthy foods. Jiang (2023) uses U.S. census data, specifically from 2000 to 2019, to evaluate racial and ethnic disparities in exposure to food environments and the concentration of markets, using census tracts as the neighborhood unit of analysis (Jiang, Ghosh, Steinbach, Stowers, 2023). The graph depicts a 20% decrease in HHI associated with a 26% decrease in mRFEI - effectively a continual reduction in household income linked to a reduction in the percentage of healthy food retailers in a specific geographic area.

Nearly all formerly redlined zones in 138 analyzed metropolitan areas are still disproportionately inhabited by Black, Latino, or Asian residents compared to their surrounding areas, showcasing the lasting impact of redlining practices (Best, Mejía, 2022). For instance, in Cleveland, redlined neighborhoods remain some of the most starkly segregated in the country, with formerly redlined zones having over 80% more Black residents than the surrounding metropolitan area. The historical segregation and disinvestment

by supermarkets in redlined neighborhoods from that time frame has contributed to food insecurity, as these areas often lack access to grocery stores and fresh, affordable food options.

Implications of Supermarket Redlining

The U.S Department of Agriculture defines food deserts as areas with limited access to food where at least 500 people or 33% of the population lives more than 1 mile from a supermarket or large grocery store in urban areas, or 10 miles in rural areas. Food deserts typically exist in poorer neighborhoods and increase the barriers to accessing healthy and nutritious foods. Supermarkets typically do not locate in these neighborhoods because it is more profitable to locate in more affluent areas. With fewer supermarkets nearby, these food insecure populations are located farther from large food retailers that supply fresh produce at reasonable prices (Meehan, 2020). As a consequence, the already-disadvantaged neighborhoods have even less access to affordable healthy food.

One example of a food desert is Noxubee County in Mississippi. In 2019, Noxubee county had a population of 10,425 residents, 72% of whom were Black (Jackson, 2022, St. Louis Fed, 2024). The county is classified as a food desert due to its lack of grocery stores. It only has one full grocery store, owned by a White family, located in the Macon county seat serving approximately 34% of the residents. Black residents of Noxubee county often complain that they must drive to another county to get reasonable prices. Such travel requires good transportation which is not easily available to people living in poverty. The majority of Noxubee County residents are both low-income and residents of rural communities, and both groups are affected by food deserts (Jackson, 2022).

Noxubee residents' situation is exacerbated by historical redlining practices, economic disparities, and the phenomenon of "supermarket redlining". In 2019, Feeding America reported that nearly 21% of Noxubee County residents were considered food insecure, a rate significantly higher than the respective state and national averages of approximately 9.2% and 10.5% (Jackson, 2022, World Population Review, 2024).

The implications of supermarket redlining are not limited to food access, but also affect the health of future generations. Hartford, Connecticut has a population of approximately 125,000 residents. Transportation is a barrier to food access in Hartford, as 35% of households in the city do not own cars and many people have to travel outside the city's borders to neighboring wealthier communities to access healthy and fresh food. Currently, there is only one full-service grocery store located within Hartford city limits, on the western border of the city (CT Food Association, 2023). The North End of Hartford is described as one of Connecticut's worst food deserts, and has been struggling to get a full-service grocery store for decades. Hartford recently ranked as the eighth worst city in the U.S. for providing access to healthy and affordable food for its residents, forcing families to turn to unhealthy alternatives. A related study found that 37% of preschool students

surveyed in Hartford were obese because they had to turn to unhealthy alternatives (Hartford Courant, 2018). The obesity rate for Hartford preschoolers was nearly triple the national average of 12.7% (CDC, 2024).

Food Insecurity & Food Banks

In 2022, nearly 30% of the global population (approximately 2.4 billion people) did not have constant access to food, with 900 million facing severe food insecurity (Thomson, 2023). According to The World Economic Forum's analysis of food insecurity in 2023 crises like the COVID-19 pandemic have contributed to a further increase in global hunger and food insecurity levels. Access to healthy diets has deteriorated since the global pandemic, with 3.1 billion people unable to afford a nutritious diet in 2021, an increase of 134 million people compared with 2019. An additional 122 million people have been pushed into hunger since 2019. The impact of food insecurity is particularly pronounced for children, with 148 million under 5 years old stunted, 45 million wasted, and 37 million overweight in 2022 (Thomson, 2023).

In the U.S., food insecurity affects 47 million people annually (Move For Hunger, 2024). Impoverished communities have higher rates of food insecurity. According to the USDA, rural areas in the U.S. have higher poverty rates than urban areas, at 16.1% versus 12.6%, respectively, and greater food insecurity rates than the overall population, at 12.1% in rural communities versus 10.5% of all households, respectively (USDA, 2024). These communities incur increased costs to secure healthy food and ultimately turn to less nutritious average diets. Despite the high need for healthy foods, the U.S. wastes an estimated $15 billion worth of fruits and vegetables each year. In the United Kingdom, supermarkets throw away 100,000 tons of edible food annually, enough to feed 30 million people each year (BusinessWaste, 2024).

Supermarkets contribute to a large share of wasted nutritional food (Lowrey, Boyer, 2023). Nearly 30% of food in American grocery stores is thrown away, totaling 16 billion pounds of food waste every year. The confusion over sell-by and best-by date labels contributes to 54.6% of all food discarded at grocery stores (Morawski, 2024). With these labels being a factor, "one-third of a product's shelf-life remains after the sell-by date for the consumer to use at home" (Breedlove, 2024). All major supermarket grocery stores and food retailers such as Kroger, Walmart and Costco donate large amounts of food to food banks and pastries. Close to 2 billion pounds of food was donated across the U.S. in 2022 alone, which amounted to $3.5 billion that year or less than $2 per pound (Lowrey, 2024).

Food banks play a critical role in redistributing unsold food that is past its expiration date, but is nonetheless safe to eat. They primarily operate as nonprofits and serve as critical hubs for food distribution, collecting surplus food from manufacturers, retailers, and local farms to support community hunger relief efforts. They store and distribute food to smaller organizations like food pantries and soup kitchens, which then provide meals directly

to individuals and families in need. Most of the food is obtained through donations, but food banks also purchase items to meet specific community needs, ensuring a diverse supply of nutritious options. Historically, the way food was distributed to food banks was based on a hierarchical queuing system: larger food banks receive higher quantities while smaller ones receive less and a queue determines who receives food and when. The queue was determined by the amount of food that a food bank had received compared to a measure of need called the "Goal Factor," which is (roughly) the number of poor in a food bank's area compared to the national average. Despite their well defined system, however, excess food still goes to waste because individual bank needs such as size, type and storage capacity are not taken into account when distributing food (Prendergast, 2017). Food banks receive food from different donors that don't know how much food and of what kind each food bank already has. If a food bank already has enough for its clients at a point in time, any extra that it receives may even go to waste. The concern is exacerbated by spoilage issues: for example, fresh produce is often only donated close to its expiration date.

United Nations' Food Security Initiatives

Supermarket redlining intensifies food insecurity, and therefore presents a large challenge to the Sustainable Development Goals (SDG) set out by the United Nations in 2015 (Manzoor, Fayaz, Dar, Dash, Shams, Bashir, Pandey, Abdi, 2024). The first goal is "Zero Hunger," which involves creating a world free of hunger and food insecurity. It is important to recognize that achieving zero hunger involves addressing the root causes of food insecurity including structural racism, deepening inequalities (e.g. as a result of supermarket redlining), and solutions that only work in the short term (United Nations, 2015).

Another goal is "Responsible Consumption and Production," which aims to achieve sustainable consumption and production patterns that influence the livelihoods of current and future generations (Dennard, Kristjansson, Tchangalova, Totton, Winham, O'Connor, 2022). Food waste is a sign of overconsumption, and tackling food loss is urgent and requires data-driven policies as well as investments in technologies, infrastructure, education and monitoring. There is growing recognition in the health sciences, particularly public health, that discrimination and structural racism are key contributors to inequity in health behaviors and outcomes (Odoms-Young, 2018). Supermarket redlining exacerbates the problem as it leads to inequitable distribution of healthy food, preventing it from reaching places with children and families in need.

Past Solutions

Certain initiatives have been implemented to combat the issue of food insecurity, but there were limitations that made them unsustainable for long term practices. One example is the California Senate Bill 1383, also known as Organics Reduction & Recycling Law, enacted in 2022. It mandated large

supermarkets to donate unsold, but consumable, food to the less fortunate. While the law addresses immediate food waste and hunger issues, it fails to tackle the root causes of food insecurity. Furthermore, its implementation requires significant resources and logistical coordination. There are also concerns about the food safety and quality as the plan, developed based on the guidelines in the law, creates an overreliance on donations rather than creating a more equitable food system (CalRecycle, 2024).

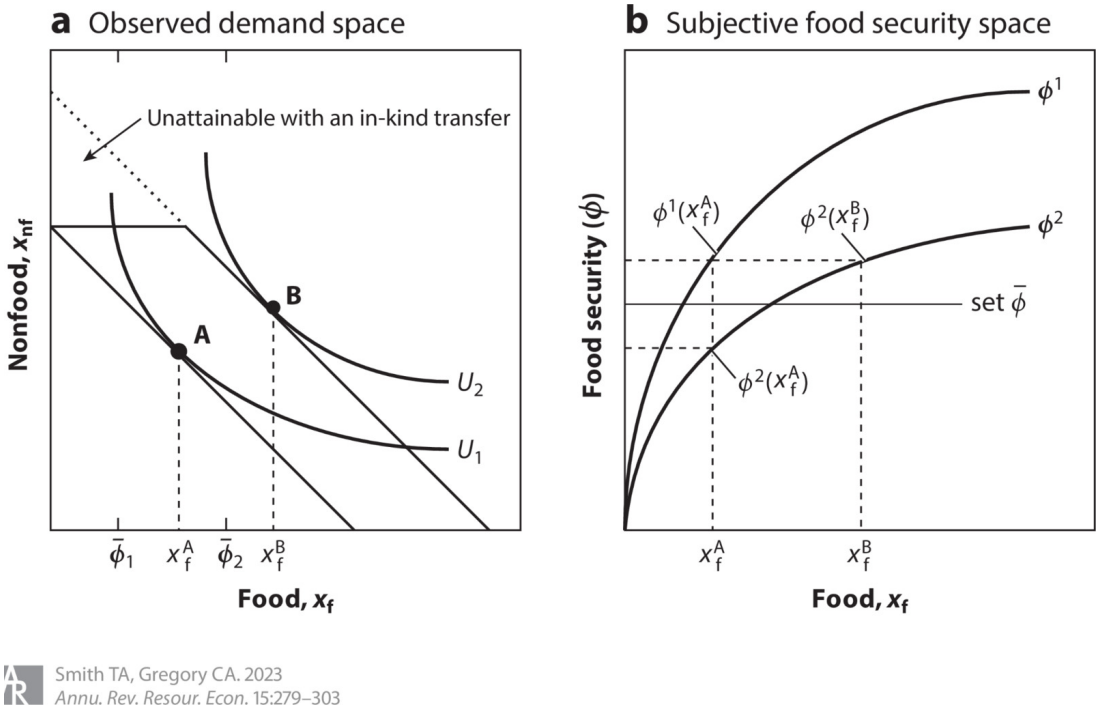
Food insecurity has increased by 63% since the start of the pandemic, with households that experienced job disruption suffered disproportionately (Pignotti, Dougan, Tablas-Mejia, Telias, Gounden, 2021). In response to the COVID-19 pandemic, a U.S. program named Project MUSE aimed to increase surplus food redistribution to improve food access through a partnership between public health and a technology-based company (Ayala, Caldwell, Garcia-Silva, Shah, Garcia, Kuo, 2022). The project found that redistributing surplus food that would otherwise be discarded represents a viable strategy both for increasing food access and for addressing climate change. The study describes a public-private partnership in Los Angeles County that implemented a food redistribution program using a mobile app to connect food businesses with surplus food to community-based organizations (CBOs) that could distribute the food to communities in need.

Developed in response to increased food insecurity caused by the pandemic, the program achieved significant engagement: 50 food businesses participated, and volunteers recovered 43,900 pounds of food, delivering surplus food to 34 community sites that served 28,400 meals. The initiative prioritized obtaining food of high nutritional value and tracked metrics such as pounds of food donated, meal equivalents, CO2 emissions averted, and water saved. However, the plan faced sustainability challenges. The reliance on a mobile app required consistent technological access and literacy, which served as a barrier for some participants. Further, it was difficult to scale. The program depended heavily on consistent and reliable food donations, and would require long-term funding to maintain. There are arguments that state supermarket redlining could theoretically be solved by the redistribution of food, but there are many practical hurdles. It is nearly impossible to solve given the nature of society in which we reside where economic considerations often take precedence over social welfare; where companies prioritize profits, causing them to locate in regions where profit margins are highest, while neglecting the needs of communities that require access to nutritious food options (Midgley, 2013). Achieving surplus food redistribution is just one part of the solution to address food insecurity. We must work toward creating a more equitable food system that prioritizes the needs of all individuals, regardless of their background or socioeconomic status.

Other critics from the Urban Institute, a Washington, D.C. based think tank that conducts economic and social policy research, state that, while the Supplemental Nutrition Assistance Program (SNAP) effectively reduces food insecurity, it faces several challenges that prevent it from being a fully

tangible solution (Waxman, Gupta, 2023). SNAP benefits are consistently inadequate to meet the nutritional needs of recipients, meaning that even with assistance, many families still struggle to afford enough healthy food. Additionally, their food stamps are only useful to those already located near a food establishment, but CDC states that the average person lives 2.6 miles away from one (Liu, Han, Cohen, 2015). Work requirements, which are intended to encourage employment, have also been found to be ineffective and can actually exacerbate food insecurity. Furthermore, stigmatizing SNAP purchases does not help; instead, incentivizing healthy eating proves to be more effective.

Figure 2 below helps us interpret and visualize the notion of food insecurity in an economic framework. It analyzes a neoclassical utility problem for a household, where a pre-set budget determines what food and nonfood items are purchased.



Smith TA, Gregory CA. 2023
Annu. Rev. Resour. Econ. 15:279–303

Fig 2. Observed Demand Space and Subjective Food Security Space Depiction (Smith, Gregory, 2023)

Figure 2a (the left graph) illustrates the model for a household in which utility is maximized at point A for some initial budget constraint. The addition of SNAP food stamps (whose value is less than the amount the household spends on food) enables the family to redirect funds to other areas relaxing the budget constraint represented by point B. Figure 2b depicts two household types to show that observed food demands do not correlate to food security. It is impossible to draw any clear conclusions about a level of food security for a given household based on the amount of food purchased. As a result, two individuals with the same budgets who have different access to nutritional food might spend the same amount, but not receive adequate nutritional quality. Since food security can be subjective, individuals may have

less access to actual nutritious foods but may be regarded as being at the same level of food security as someone who has access to food rich in nutrients. For the same reason, SNAP food stamps alone are not adequate to achieve universal food security.

Redistribution as a Solution

Redistribution and donation of food waste can directly contribute to addressing the Sustainable Development Goals, outlined earlier, by ensuring that surplus food reaches those in need (Dennard, Kristjansson, Tchangalova, Totton, Winham, O'Connor, 2022, Angela M Odoms-Young, 2019). A 2022 study on the environmental savings from food donation conducted by two Universities in Sweden, showed that when surplus food was redistributed, 78% of it was eaten. It compared the effectiveness, carbon footprint and rebound effect of a food donation system with those of anaerobic digestion (turning wasted food into biogas). The study highlighted both the benefits and challenges of surplus food redistribution. It found that the overall climate benefit of food donation was almost twice that of anaerobic digestion. Even with the rebound effect, redistributing surplus food still resulted in a greater net positive impact on the environment compared to another common method of managing food waste: anaerobic digestion. There was also a substantial rebound effect (reduction in benefits), offsetting 51% of potential carbon emission savings from food donations (Sundin, Osowski, Strid, Eriksson, 2022).

Proposed Solution

Food waste can be categorized into three distinct types:

- Unwasted consumable food: Fresh vegetables, fruits, dairy and meat that is sold in grocery stores and consumed on a regular basis.
- Wasted consumable food: Milk, bread and fruits like bananas and avocados, which are often thrown away due to misinterpretation of expiration dates or poor storage techniques (RTS, 2024) (SkipShapiro, 2024).
- Wasted nonconsumable food: Meat bones, eggshells, and vegetable peels that are not consumable, but can be processed in systems like Grind2Energy, which converts them into energy and fertilizer (Blasko, 2019).

People have developed solutions for unwasted consumable food and wasted nonconsumable food, but no sustainable solutions exist for wasted consumable food. Reducing food waste through a circular model aligns with responsible consumption and production; i.e., it can significantly decrease the

environmental impact of food waste while improving food security (Hines, Brody, Zhou, Collins, Omenyi, Miller III, Cooper, Crews, 2023, Angela M Odoms-Young, 2018).

Figure 3 below illustrates the use of a circular model to address food insecurity and food waste. For example, does selling the wasted consumable food at a lower price to the food banks and charities create incentive for supermarkets that could be incorporated in a circular model?

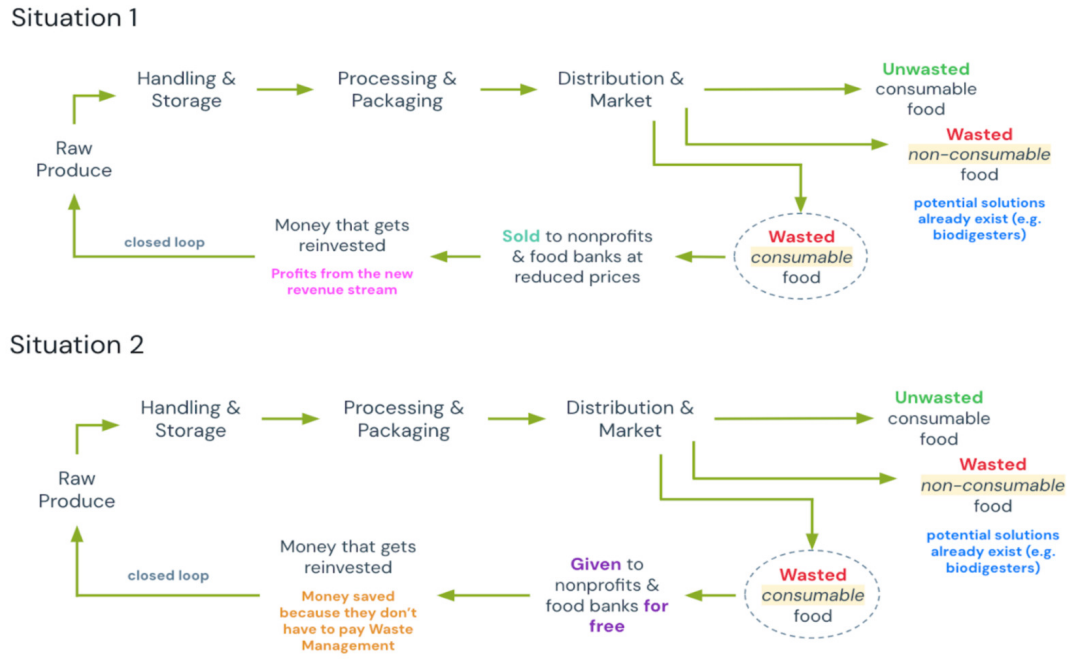


Fig 3. Circular Model for Food Insecurity

Situation 1: Instead of losing money by paying waste management to take the food off of their hands and put it into landfills, supermarkets would gain money and the food would not go to waste, allowing circularity to be established by reinvesting money back into the system for it to repeat.

Situation 2: Instead of losing money by paying waste management to take the food off of their hands and put it into landfills, they would save money and the food would be given to food banks for free. Money is leftover to reinvest back into the system, enabling circularity.

Situation 1 clearly offers more sustainability and feasibility because it generates a new revenue stream, creating a better incentive for supermarkets than Situation 2. We can, however, strengthen the incentive for supermarkets to adopt the circular model. Below, we present a two-step approach to do so:

1. Make the cost of wasted consumable food (e.g. money paid to waste management) more visible and quantifiable.

2. Make supermarkets aware of the rising risk of these costs amplifying over time if they don't take care of the problem now.

Making the cost of wasted consumable food visible and quantifiable to supermarkets will show them how much money they could save. Supermarkets also have a tendency to externalize costs, but in doing so, they underestimate these costs that compound over time, leaving them in a complex dilemma. Shifting the costs from external factors is not feasible and by forcing supermarkets to go circular, they break the cycle of externalizing costs and mitigate future risks.

Limitations to the Proposed Solution and Potential Future Research Topics

The proposed approach to addressing food waste and improving food system equity faces several challenges that require further research and consideration. One key area is the need to quantify and make visible the cost of wasted consumable food to supermarkets (ReFed, 2024). Visibility is crucial for breaking the cycle of cost externalization by supermarkets and encouraging more responsible practices. Addressing consumer behavior is another critical aspect. Even if healthy food becomes more affordable, people accustomed to consuming cheap, unhealthy options may have a hard time breaking their unhealthy habits (32). The prevalence of unhealthy ingredients like added sugars and vegetable oils in processed foods, has created deeply ingrained consumption patterns (Jordans, Kohrt, Sangraula, Turner, Wang, Shrestha, Ghimire, Hof, Bryant, Dawson, Marahatta, Luitel, Ommeren, 2021). These habits are often reinforced by the use of food as a coping mechanism for stress, replacing traditional forms of communal support (American Psychological Association, 2013).

Several steps are necessary to implement an effective solution:

1. Develop behavioral design interventions to address unhealthy eating habits and promote nutritious choices (e.g. nutrition programs that help communities that are prone to unhealthy eating habits) (Davis, Redford, 2019).

2. Create a more equitable food system by improving the efficiency of food banks. Implementing a model where food banks purchase food from supermarkets at reduced prices can ensure better quality control and reduce waste (Foodbanknews, 2023).

3. Enhance the effectiveness of SNAP (Supplemental Nutrition Assistance Program) by coordinating with food banks to offer subsidized healthy foods, making the allocated benefits sufficient for families (Carlson, Llobrera, Keith-Jennings, 2021).

By implementing these steps, we can create a more circular and equitable food system that reduces waste, improves access to healthy food, and addresses the underlying behavioral and economic factors contributing to food insecurity and poor nutrition. The approach not only tackles the immediate issue of food waste, but also contributes to narrowing the nutritional divide between socioeconomic groups.

The proposed solution strives to strike a balance between being equitable and implementing a circular model. As an example, individual needs of a food bank are not taken into account when distributing food, often resulting in wastage. However, the model above introduces money into the distribution system. Food banks will pay for food from supermarkets, therefore ensuring better control over the capacity and quality of the food that they receive. Achieving equity may prove to be even more challenging. As an example, SNAP food stamps do not cater to different levels of food security, and therefore do not provide enough money for a family to sustain themselves. Food banks could potentially sell foods at lower prices, so that more food could be purchased using the same stamp. Food stamps will be more effective to enable people to pay for food in proportion to their income (CBPP, 2024).

It is important to note, however, that the proposed food redistribution plan may inadvertently widen the wealth gap between rich and poor. Charitable food redistribution models often reinforce existing power imbalances, allowing wealthier donors to benefit from tax incentives while low-income communities depend on these systems (Lohnes, 2020). Also, affluent areas typically have better access to the infrastructure needed for effective food redistribution, which can increase disparities in food access among socioeconomic groups (Hilmers, Hilmers, Dave, 2012). To mitigate these unintended consequences, future research should explore community ownership models and analyze the long-term economic impacts on recipient communities.

Summary & Conclusion

Supermarket redlining exacerbates food insecurity and, therefore, contributes to harming the health of future generations. The United Nations has several Sustainable Development Goals focused on addressing these disparities (Manzoor, Fayaz, Dar, Dash, Shams, Bashir, Pandey, Abdi, 2024). While there are some initiatives at the country level, they rely on consistent donations from local organizations, which make them difficult to scale and less viable as long-term solutions. We propose a circular model for food waste management that could alleviate food insecurity while incentivizing supermarkets to build long-term solutions to the redlining problem. Researchers need to do more work in quantifying wasted consumable food, breaking the cycle of cost externalization, and finally addressing people's willingness to adopt healthier alternatives when given the option.

Acknowledgements

I'd like to thank Jack Hirsch for his mentoring throughout this project as his expertise in economics guided my thought process in terms of my analysis proposed solution.

Published: March 04, 2025 EST.

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