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A LOT TO DIGEST: ADVANCING FOOD WASTE POLICY IN THE UNITED STATES

ABSTRACT

An estimated thirty-one percent of the food grown, produced, and transported in the United States is wasted annually. This waste translates into ninety-six billion pounds of food and \$165 billion in lost economic value. Food waste occurs at all phases of the supply chain, stretching from farm to table, and imposes substantial economic, environmental, and social costs. This Article highlights the staggering quantity of food waste in the United States and argues that certain innovative policies and market-based initiatives that strategically target the most egregious and unjustifiable types of food waste can efficiently reduce this problem. Applying a simple cost-benefit framework to determine when it is most cost-justifiable to reduce food waste, this Article identifies specific stages of the food supply chain where food waste reduction policies are likely to generate net social benefits. The Article also sets forth principles to aid policymakers in tailoring incentive policies and legal requirements to optimally mitigate food waste in the coming decades.

INTRODUCTION

Food waste in the United States is a pervasive problem with far-reaching economic, social, and environmental effects. Americans produce ninety-six billion pounds of food waste annually,¹ much of which cannot be justified. This wasted food represents nearly one-third of all food produced in the United States each year.² Daily activities in California's Salinas Valley exemplify the severity of the

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1. See Jessica A. Cohen, *Ten Years of Leftovers with Many Hungry Still Left Over: A Decade of Donations Under the Bill Emerson Good Samaritan Food Donation Act*, 5 SEATTLE J. FOR SOC. JUST. 455, 455 (2006). Food waste is "the organic residu[e] generated by the handling, storage, sale, preparation, cooking, and serving of foods." *Id.*

2. Chris Vogliano & Katie Brown, *The State of America's Wasted Food and Opportunities to Make a Difference*, 116 J. ACAD. NUTRITION & DIETETICS 1199, 1199 (2016). This quantity of waste is "equivalent [to] throwing 320,000 jumbo jet[s] worth of food directly into the landfill each year." *Id.*

nation's food waste problem. Known as "America's salad bowl,"³ the Salinas Valley produces seventy percent of the lettuce sold in United States retail markets.⁴ Each day, countless trucks arrive at farms and processing plants in the valley to pick up lettuce for distribution and sale throughout the country, while numerous others pick up seemingly perfect boxes and bags of lettuce for trips to the landfill instead.⁵ Literally tons of vitamin-rich, unblemished leafy greens are wasted each week in the valley merely because they are packaged into containers that are improperly filled or mislabeled.⁶

Similar occurrences involving avoidable food waste occur regularly on farms throughout the United States.⁷ In many areas, farmers discard edible fruits and vegetables due to aesthetic imperfections, overproduction, or lack of sufficient cold storage.⁸ However, the food waste problem extends well beyond the production stage, occurring at every step of the supply chain from farm to consumer. School cafeterias, retailers, restaurants, and consumers routinely throw away astoundingly large volumes of food.⁹ This waste imposes economic, environmental, and social costs that affect nearly every person on the planet.¹⁰

This Article argues that innovative policies and market-based initiatives that strategically target the most egregious and unjustifiable types of food waste could greatly reduce unnecessary food disposal in the United States. Part I of this Article describes the extent of the nation's food waste problem and its impacts. Part II explores existing policies in the United States aimed at reducing food waste and how they fall short, and also highlights how various other policies inadvertently contribute to the problem. Part III sets forth a framework for identifying more optimal policy strategies for reducing food waste. The framework consists of a cost-benefit analysis that weighs the relative private and social costs and benefits of reducing food waste at each stage of the food supply chain. In conclusion, we apply the framework to ultimately advocate for several specific policies that are particularly well-tailored to reduce food waste in the United States.¹¹

3. Allison Aubrey, *Why Are Tons of Fresh Produce Dumped in Landfills Every Day?*, PBS NEWSHOUR (June 16, 2015, 12:25 PM EST), <http://www.pbs.org/newshour/rundown/tons-fresh-produce-dumped-landfills-every-day/>.

4. Elizabeth Royte, *One-Third of Food Is Lost or Wasted: What Can Be Done*, NAT'L GEOGRAPHIC (Oct. 13, 2014), <http://news.nationalgeographic.com/news/2014/10/141013-food-waste-national-security-environment-science-ngfood/>.

5. *See id.*

6. *See id.*; *see also* Aubrey, *supra* note 3 ("The bags [of salad] we saw at the dump still had almost two weeks before reaching the sell-by date. But that was probably not long enough to ship them and get them onto store shelves, because grocery chains need plenty of time to sell the products while they're still fresh.").

7. *See, e.g.*, Jesse Hirsch & Reyhan Harmanci, *Food Waste: The Next Food Revolution*, MODERN FARMER (Sept. 30, 2013), <http://modernfarmer.com/2013/09/next-food-revolution-youre-eating/>.

8. *See id.*

9. *See infra* notes 12–21 and accompanying text.

10. *See infra* notes 22–32 and accompanying text.

11. A small number of commentators have drawn attention to the nation's food waste problem. *See, e.g.*, Megan Cronin, *Wasted: A Failure of Food Waste Reduction and Pollution Prevention*, GEO. ENVT'L. L. REV. ONLINE (Jan. 8, 2016), <https://gelr.org/2016/01/08/wasted-a-failure-of-food-waste-reduction-and-pollution-prevention/> (discussing the food waste problem in the United States and the Environmental Protection Agency's and United States Department of Agriculture's food waste

I. THE PROBLEM OF FOOD WASTE AND WHY IT MATTERS

An estimated thirty-one percent of all food produced in the United States is wasted every year.¹² This dramatic proportion of waste translates into ninety-six billion pounds of food and \$165 billion in lost economic value.¹³ Lost and wasted food has far-reaching economic, environmental, and social implications.¹⁴ Unfortunately, many producers of food waste in the United States are, in large part, unable to internalize the benefits of reducing waste and thus have little incentive to change their practices.¹⁵

Each day, edible food is discarded at all stages in the long supply chain stretching from farms to individual kitchens throughout the country.¹⁶ At the farm stage, overproduction, damage from weather, insects and animals, and outgrading for aesthetic and quality standards all significantly contribute to food loss.¹⁷ Then, before food is even purchased, additional losses occur due to improper handling, quality deterioration during transport, and inadequate infrastructure for cooling and storage. According to one estimate, up to twenty percent of fruit and vegetable losses in developed countries occur before food even reaches retail stores.¹⁸ At the retail level, waste routinely occurs when retailers reject shipments of edible food because they do not meet aesthetic standards.¹⁹ Even at the point of food

reduction efforts); Carmen Shaeffer Kalashian, Comment, *Out of Sight, Out of Mind: Finding a Solution to Food Waste in America*, 23 SAN JOAQUIN AGRIC. L. REV. 103 (2014) (contending that standardized food date labels could mitigate the food waste problem in the United States). However, none have applied microeconomic theory to rigorously analyze the issue.

12. JEAN C. BUZBY ET AL., U.S. DEP'T OF AGRIC., EIB-121, THE ESTIMATED AMOUNT, VALUE, AND CALORIES OF POSTHARVEST FOOD LOSSES AT THE RETAIL AND CONSUMER LEVELS IN THE UNITED STATES, at ii (2014), https://www.ers.usda.gov/webdocs/publications/43833/43680_eib121.pdf?v=41817.

13. Cohen, *Ten Years of Leftovers with Many Hungry Still Left Over: A Decade of Donations Under the Bill Emerson Good Samaritan Food Donation Act*, 5 SEATTLE J. FOR SOC. JUST. 455 (2006). Food waste accounts for the largest percentage of waste in municipal landfills in the United States: Americans throw away more food than paper, yard trimmings, glass, metals, or plastics. L.L.M. PROGRAM IN AGRIC. & FOOD LAW, UNIV. OF ARK. SCH. OF LAW, FOOD RECOVERY: A LEGAL GUIDE 4 (2013) [hereinafter FOOD RECOVERY: A LEGAL GUIDE], <http://law.uark.edu/service-outreach/food-recovery-project/Legal-Guide-To-Food-Recovery.pdf>.

14. See *infra* notes 23–32 and accompanying text.

15. See generally *infra* notes 33–34 and accompanying text.

16. See Jean C. Buzby & Jeffrey Hyman, *Total and Per Capita Value of Food Loss in the United States*, 37 FOOD POL'Y 561, 563 (2012) (detailing causes of food loss and waste in developed countries at the farm, retail, and consumer levels in the supply chain).

17. See *id.*

18. See Emily Nink, *10 Facts You Might Not Know About Food Waste*, FOODTANK (last visited Feb. 19, 2018) (citation to linked source omitted), <http://foodtank.com/news/2015/06/world-environment-day-10-facts-about-food-waste-from-bcfn>. In poorer nations, where most consumers would not dream of rejecting good food based on appearance, most food waste results from infrastructure shortfalls, like a lack of refrigerated storage or poor roads that make it hard to get crops to market. FOOD COWBOY, ENDGAME FOR FOOD WASTE 3 (2016), [https://d3n8a8pro7vnm.cloudfront.net/foodcowboy/pages/53/attachments/original/1467143149/Endgame_for_Food_Waste_\(June_2016\).pdf?1467143149](https://d3n8a8pro7vnm.cloudfront.net/foodcowboy/pages/53/attachments/original/1467143149/Endgame_for_Food_Waste_(June_2016).pdf?1467143149).

19. Nink, *supra* note 18. Fortunately, consumers and supermarkets around the world are changing these standards to accept ugly fruits and vegetables and prevent food waste. Angelique Chrisafis, *France to Force Big Supermarkets to Give Unsold Food to Charities*, GUARDIAN (May 22, 2015, 13:59 EDT), <https://www.theguardian.com/world/2015/may/22/france-to-force-big-supermarkets-to-give-away->

consumption, waste is commonplace. Plate waste—the disposal of prepared whole food by consumers—is a significant contributor to losses in schools, cafeterias, and other food service settings, and results primarily from excessive portions and undesired accompaniments. In fact, diners leave seventeen percent of meals uneaten and fail to take fifty-five percent of potential leftovers home.²⁰

Within American homes, individual consumers are likewise responsible for a large portion of the food wasted in the United States. Consumer food waste often results from confusion regarding “use by” and “best by” date labeling, improper storage, and over-purchasing.²¹ For example, many Americans admit to throwing away items after the best by date has passed, thinking this practice reduces their risk of acquiring a foodborne illness.²² However, due to a lack of practical guidance and regulatory oversight, dates on food packages are largely arbitrary and inconsistent, which can lead Americans to dispose of food prematurely.²³ Additionally, consumers tend to overbuy food because it is relatively inexpensive in the United States.²⁴ By extension, these low food costs cause many to wrongly view the social costs associated with wasting food as inconsequential.²⁵

When aggregated, the costs of food waste in the United States are enormous.²⁶ One clear consequence of food waste is that it reduces opportunities to feed hungry people.²⁷ In a global context, this consequence is aggravated by the

unsold-food-to-charity. For example, French supermarkets are banned from throwing away or destroying edible food and must instead donate it to charities or for animal feed. Angelique Chrisafis, *French Law Forbids Food Waste by Supermarkets*, GUARDIAN (Feb. 4, 2016, 11:03 EST), <https://www.theguardian.com/world/2016/feb/04/french-law-forbids-food-waste-by-supermarkets>. See *infra* notes 203–08 and accompanying text for further discussion on efforts to reduce food waste in other countries.

20. DANA GUNDERS, NAT. RES. DEF. COUNCIL, IP:12-06-B, WASTED: HOW AMERICA IS LOSING UP TO 40 PERCENT OF ITS FOOD FROM FARM TO FORK TO LANDFILL 11 (2012), <https://www.nrdc.org/sites/default/files/wasted-food-IP.pdf>; see also *id.* (citations omitted) (“Portion sizes have increased significantly over the past 30 years. From 1982 to 2002, the average pizza slice grew 70 percent in calories, the average chicken caesar salad doubled in calories, and the average chocolate chip cookie quadrupled. Today, portion sizes [at restaurants] can be two to eight times larger than [the serving sizes recommended by the United States Department of Agriculture or the Food and Drug Administration].”).

21. See BUZBY & HYMAN, *supra* note 16, at 563.

22. Emily Broad Leib, *Eliminate Laws That Cause Healthy Food to Go to Waste*, N.Y. TIMES: OPINION PAGES (Sept. 21, 2016), <http://www.nytimes.com/roomfordebate/2016/09/21/keeping-food-on-the-plate-and-out-of-landfills/eliminate-laws-that-cause-healthy-food-to-go-to-waste>.

23. Amrith Ramkumar, *America Wastes \$160 Billion in Food Every Year but Is Too Busy to Stop*, BLOOMBERG (July 22, 2016), <http://www.bloomberg.com/news/articles/2016-07-22/america-wastes-160-billion-in-food-every-year-but-is-too-busy-to-stop>.

24. Hirsch & Harmanci, *supra* note 7. Americans enjoy an extremely inexpensive food supply and pay less for their food than consumers in any other country. For example, consumers in France and Kenya spend fourteen percent and forty-five percent of household income on food respectively whereas Americans spend only six percent of household income on food. *Id.* Americans similarly “enjoy the most stable food supply of any people in the history of mankind, and have not experienced a major disruption in the food supply in American history.” *Farm Bill: A Short History and Summary*, FARM POL’Y FACTS, <https://www.farmpolicyfacts.org/farm-policy-history/> (last visited Oct. 17, 2016).

25. Royte, *supra* note 4.

26. See Buzby & Hyman, *supra* note 16, at 562 (discussing social and environmental harms caused by food waste and negative externalities of wasted food).

27. See *id.* at 568.

fact that the world population is growing and food producers will need to feed even more people in the future. The United Nations predicts that the global population will reach 9.3 billion by 2050,²⁸ an upsurge that will require at least a seventy percent increase in food production.²⁹ Within the United States, food insecurity afflicts many: in 2010, almost forty-nine million Americans lived in food-insecure households.³⁰ Hunger and food insecurity exist in the United States not because our nation lacks an adequate food supply but because systemic inefficiencies—such as those that contribute to the nation’s large volume of food waste—obstruct hungry Americans’ access to wholesome food.³¹ It has been estimated that thirty percent of all the food lost in the United States could be redistributed to supply every food-insecure American’s total diet.³²

Food waste has adverse environmental impacts that contribute to natural resource loss and climate change.³³ Food in landfills releases methane, a major contributor to global warming.³⁴ In fact, landfills account for thirty-four percent of all human-related methane emissions in the United States.³⁵ The production of food that is ultimately wasted also reduces the availability of natural resources, such as fresh water and arable land for other important uses. For example, an estimated twenty-five percent of all freshwater used in the United States and roughly 300 million barrels of oil are used annually to produce food that is eventually wasted.³⁶ Other environmental costs of food production include greenhouse gas emissions from livestock production, air pollution from the operation of farm machinery and trucks that transport food, water pollution and damage to marine and freshwater fisheries from agricultural chemical run-off, soil erosion, salinization, and depletion of nutrients arising from unsustainable production and irrigation practices.³⁷

Despite the significant environmental and social costs associated with wasteful food practices, staggering levels of food waste continue in the United States. One explanation for the high quantity of food waste in the United States is that those who waste food do not recognize the costs of their actions. In

28. *World Population Projected to Reach 9.6 Billion by 2050*, U.N. DEP’T ECON. & SOC. AFF. (June 13, 2013), <http://www.un.org/en/development/desa/news/population/un-report-world-population-projected-to-reach-9-6-billion-by-2050.html>.

29. FOOD & AGRIC. ORG., *HOW TO FEED THE WORLD IN 2050* (2009), http://www.fao.org/fileadmin/templates/wsfs/docs/expert_paper/How_to_Feed_the_World_in_2050.pdf.

30. Buzby & Hyman, *supra* note 16, at 562. Someone who is food insecure lacks “regular access to sufficient food [to sustain] an active, healthy [lifestyle].” FOOD RECOVERY: A LEGAL GUIDE, *supra* note 13, at 4.

31. Cohen, *supra* note 1, at 456.

32. EMILY BROAD LEIB ET AL., HARVARD FOOD LAW AND POLICY CLINIC & NAT. RES. DEF. COUNCIL, R:13-09-A, *THE DATING GAME: HOW CONFUSING FOOD DATE LABELS LEAD TO FOOD WASTE IN AMERICA 5* (2013) (citation to source omitted), <http://www.chlpi.org/wp-content/uploads/2013/12/dating-game-report.pdf>.

33. SARA ECKHOUSE, U.S. DEP’T OF AGRIC., *THE U.S. FOOD WASTE CHALLENGE* (2013), <http://www.ncsl.org/documents/statefed/SarahEckhouseUSDA.pdf>.

34. Buzby & Hyman, *supra* note 16, at 562. Landfilling food waste generates methane gas, which has twenty-five times the global warming potential of carbon dioxide. *Id.*

35. *Id.*

36. *Id.*

37. *Id.*

microeconomics terms, food waste is a classic negative externality problem: individuals and businesses that waste food do not bear many of the costs associated with it, so they tend to keep doing it.³⁸ It appears likely that many individuals and businesses that throw away perfectly good food do not consider the environmental or broader societal impacts of this practice. For instance, according to one study, less than sixty percent of Americans recognize that wasting food is bad for the environment.³⁹ Until governments or other institutions begin to address these externality problems, food waste and its attendant social welfare losses will likely continue.

II. EXISTING FOOD POLICIES THAT AFFECT FOOD WASTE

Federal, state, and local governments recognize that wasteful food practices are costly to society and have made various attempts over the years to deter them. The private sector has engaged in efforts to encourage greater food conservation as well. Collectively, these numerous policies and practices are better than no policy effort at all, but they unfortunately fall short of effectively addressing the problem. This section describes and analyzes several federal, state, and municipal policies aimed at mitigating food waste and ultimately argues that more policy attention is needed in this increasingly important area of the law.

A. A Nationally-Recognized Problem: Federal Attempts to Mitigate Food Waste

For decades, the federal government has tried to discourage food waste in many ways, encountering varying degrees of success. Numerous policies have been introduced or enacted at the federal level to combat food waste, including federal regulatory programs and legislation. The following are descriptions of some of the most important federal-level efforts to date and those policies' shortcomings as tools for reducing the nation's food waste.

1. *The EPA and USDA's Food Recovery Hierarchy and Food Waste Challenge*

In recent years, the United States Department of Agriculture (USDA) and Environmental Protection Agency (EPA) have made several attempts to address the nation's food waste problem. Through nationwide education initiatives, these agencies have sought to increase public awareness of the food waste dilemma and to remind individual consumers of what they can do to help.⁴⁰ Most notably, in 2015, USDA and EPA announced the first ever national food loss and waste goal: a

38. Lisa Grow Sun & Brigham Daniels, *Mirrored Externalities*, 90 NOTRE DAME L. REV. 135, 137 (defining negative externalities as costs an actor imposes on third parties because he does not consider the cost in his decision-making).

39. Ramkumar, *supra* note 23. For example, many Americans are unaware that wasted food in landfills contributes to methane emissions. *Id.*

40. *See, e.g.*, Press Release, U.S. Dep't of Agric., USDA and EPA Join with Private Sector, Charitable Organizations to Set Nation's First Food Waste Reduction Goals, (Sept. 16, 2015), <https://www.usda.gov/media/press-releases/2015/09/16/usda-and-epa-join-private-sector-charitable-organizations-set>.

fifty percent reduction in food loss and waste by 2030.⁴¹ To help the public better understand how to make the greatest food recovery impact, EPA promulgated a hierarchy prioritizing five food recovery actions by their potential to benefit the environment, society, and the economy.⁴² The five action levels are: (i) source reduction; (ii) feeding hungry people; (iii) feeding animals; (iv) industrial uses; and (v) composting.⁴³ The EPA also initiated the Food Recovery Challenge, a program that encourages organizations to follow the hierarchy to reduce food waste.⁴⁴

Unfortunately, commentators have criticized these federal agency efforts for being redundant, overly complex, and ambiguous.⁴⁵ A primary criticism is that several of the Food Recovery Challenge's benefits were already available through different federal programs and it remains unclear what additional benefits, if any, participants can obtain through compliance.⁴⁶ Moreover, although waste along all levels of the food supply chain remains a pervasive problem, EPA's Food Recovery Challenge invites only businesses and organizations to participate and excludes the agricultural sector as well as consumers.⁴⁷ By limiting the Challenge's scope, the EPA failed to promote food waste reduction efforts on a larger scale and in some of the most promising stages of the food supply chain.

2. *The Bill Emerson Good Samaritan Act and Federal Food Donation Act of 2008*

To discourage restaurants and retailers from regularly sending large quantities of edible food to their dumpsters, Congress has enacted several laws that encourage them to donate excess food to hungry people instead. A major factor preventing significant donations of food is the fear of liability, and many restaurants and supermarkets cite that fear as the primary reason for declining to donate leftover edible food to non-profit organizations.⁴⁸ The Bill Emerson Good Samaritan Food Donation Act (GSA), signed into law by President Bill Clinton in 1996, seeks to encourage food donation by alleviating that concern.⁴⁹ The GSA exempts from liability those who donate apparently wholesome food and grocery

41. *Id.*

42. *Food Recovery Hierarchy*, U.S. ENVTL. PROTECTION AGENCY (last visited Feb. 24, 2018), <https://www.epa.gov/sustainable-management-food/food-recovery-hierarchy>.

43. *Id.*

44. *Food Recovery Challenge (FRC)*, U.S. ENVTL. PROTECTION AGENCY (last visited Mar. 5, 2018), <https://www.epa.gov/sustainable-management-food/food-recovery-challenge-frc>. In 2014, 800 Food Recovery Challenge participants prevented and diverted nearly 606,000 tons of wasted food from entering landfills or incinerators.

45. See, e.g., Dan Nosowitz, *USDA and EPA Announce First-Ever Plan to Reduce Food Waste*, MODERN FARMER (Sept. 30, 2015), <http://modernfarmer.com/2015/09/usda-epa-plan-to-reduce-food-waste/>.

46. *Id.*

47. *Food Recovery Challenge (FRC)*, *supra* note 44.

48. Steven M. Finn, *A Public-Private Initiative to Reduce Food Waste: A Framework for Local Communities*, GRADUATE STUD. J. ORGANIZATIONAL DYNAMICS, Summer 2011, at 4 (noting that the largest single factor in preventing significant donations of food is the fear of liability and telling the story of a restaurant owner who stopped donating leftover handmade pies after being sued by someone who claimed to have become sick after eating one).

49. Bill Emerson Good Samaritan Food Donation Act, 42 U.S.C. § 1791 (2012).

items in good faith to non-profit organizations,⁵⁰ thus removing a major obstacle for individuals and businesses that wish to feed hungry people with excess food.

Unfortunately, the GSA is largely unsuccessful at preventing large-scale food waste.⁵¹ Even though it provides strong liability protections to food donors, misconceptions and a lack of awareness of the law limit its effectiveness. For example, many businesses continue to cite liability concerns in regard to their failure to donate food.⁵² The GSA also falls short by failing to provide financial incentives or physical assistance for organizations that wish to donate food.⁵³ Another hurdle would-be donors face is that the GSA requires businesses to donate their food to third-party charitable organizations and not directly to the hungry.⁵⁴ These administrative obstacles are inconsistent with the GSA's purpose, as they arguably deter businesses looking to quickly donate excess food.

Although the GSA provides significant legal protection, it does little to ease corporations' fears of irreparable harm to their reputation if a food poisoning scandal were to occur involving donated food items.⁵⁵ Because there have been no documented lawsuits involving attempts to get around the GSA's defenses, courts have yet to confirm that the statute provides a reliable form of liability protection.⁵⁶ In that sense, the statute provides relatively little assurance to risk-averse companies that might otherwise donate their excess food.⁵⁷ Meanwhile, the GSA's focus on shifting the burden of feeding hungry people from the government to the private sector and to nongovernmental agencies arguably allows the federal government to assume too small a role in feeding the nation's growing population of hungry citizens. By reducing the federal government's involvement in food waste policy, the GSA has seemingly contributed to the lack of unified food waste policies across the United States.⁵⁸

Recognizing the GSA's deficiencies, Congress enacted the Federal Food Donation Act (FFDA) in 2008. The FFDA specifically targets executive agencies and their contractors.⁵⁹ The Act requires, among other things, that "all [federal] contracts above \$25,000 for the provision, service, or sale of food in the United States . . . shall include a clause that . . . encourages the donation of excess,

50. FOOD RECOVERY: A LEGAL GUIDE, *supra* note 13, at 10. "[The GSA] establishes gross negligence as the liability floor for any claims arising out of the nature, age, packaging, or condition of donated food and grocery products. In so doing, the Act eliminates the harsh default rule of strict liability for foodborne illnesses and removes the possibility of liability for ordinary negligence." *Id.*

51. See GUNDERS, *supra* note 20, at 14.

52. Leib, *supra* note 22.

53. See GUNDERS, *supra* note 20, at 14 (discussing barriers to food donation that persist despite the protections afforded by the GSA).

54. *Id.* (emphasis added) ("The Bill Emerson Food Donation Act . . . protects donors from food-safety liability when donating food to a nonprofit organization."); see also Jacob Gersen, *The Single Bad Reason We Waste Billions of Pounds of Food*, TIME (Aug. 24, 2016), <http://time.com/4463449/food-waste-laws/> (suggesting that legal difficulties in "get[ting] food that would otherwise be wasted to those who could use it" are a primary cause of food waste in the United States).

55. See Cohen, *supra* note 1, at 476.

56. FOOD RECOVERY: A LEGAL GUIDE, *supra* note 13, at 3.

57. See generally *id.*

58. See Cohen, *supra* note 1, at 456–57.

59. See 42 U.S.C. § 1792 (2012).

apparently wholesome food to nonprofit organizations that provide assistance to food-insecure people[.]”⁶⁰ The Act also affirms that the GSA continues to shield wholesome food donations made in good faith to non-profit organizations from liability,⁶¹ and clarifies that agencies and contractors that donate food are not responsible for the logistics and costs of the collection and transportation of excess food, nor the maintenance of its safety and distribution.⁶²

Although the FFDA, like the GSA, is a step in the right direction, the Act shares many of the GSA’s deficiencies. For instance, the Act does not provide financial incentives, physical assistance, or a visible, easily understandable platform to encourage businesses to participate.⁶³ Further, the Act merely “encourages,” rather than requires, federal agencies or contractors to donate food,⁶⁴ resulting in a federal law that lacks sharp regulatory teeth.

3. *Internal Revenue Code 170(e)(3) and the PATH Act*

The federal government has also attempted to reduce food waste by offering financial incentives through the tax code and other means to businesses that donate wholesome food. Under Internal Revenue Code 170(e)(3), qualified business taxpayers that have made food donations can deduct “the cost to produce the food and half the difference between the cost and full fair market value of the donated food” from taxable income when calculating income tax liability.⁶⁵ The PATH Act, enacted in 2015, further expands financial incentives for food donations by extending several food donation tax incentives and increasing the cap of allowable charitable contributions for food donations from ten percent to fifteen percent.⁶⁶

Regrettably, these federal-level tax incentive programs have shortcomings that mirror the deficiencies of the GSA and the 2008 Federal Food Donation Act. Specifically, there is a lack of awareness and transparency about these programs due to insufficient public education and outreach efforts.⁶⁷ These tax deduction programs also impose numerous conditions that can be difficult for first-time donors to understand and follow. For example, to qualify for an “enhanced deduction,” which allows businesses to deduct almost twice the general

60. *Id.*

61. *See id.* § 1792(b)(2) (“An executive agency (including an executive agency that enters into a contract with a contractor) and any contractor making donations pursuant to this section shall be exempt from civil and criminal liability to the extent provided under [the Good Samaritan Act].”).

62. *Id.* § 1792(b)(1).

63. *See id.* § 1792.

64. *Id.* § 1792(a)(1).

65. *Recovery/Donations*, U.S. DEP’T AGRIC., <https://www.usda.gov/oce/foodwaste/resources/donations.htm> (last visited Jan. 19, 2017).

66. Protecting Americans from Tax Hikes Act of 2015, 129 Stat. 3041 (2015) (codified as amended at 26 U.S.C. § 1 note (2016)).

67. *Cf. EMILY BROAD LEIB ET AL., HARVARD FOOD LAW & POLICY CLINIC, KEEPING FOOD OUT OF THE LANDFILL: POLICY IDEAS FOR STATES AND LOCALITIES* 6 (2016), http://www.chlpi.org/wp-content/uploads/2013/12/Food-Waste-Toolkit_Oct-2016_smaller.pdf (advocating increased education and awareness regarding liability protections as a means to encourage food donation and noting that, “[f]or liability protections to lead to increased food recovery, potential food donors need to know that such protections exist”).

deduction,⁶⁸ donors and donees must satisfy five specific conditions, including the completion of federal government paperwork and compliance with several other requirements.⁶⁹ Parties unfamiliar with how to qualify for deductions may thus be deterred from donating because of these additional requirements.

The PATH Act tax deduction similarly provides insufficient incentives for some smaller businesses and organizations to donate food. Instead of permitting donors to reduce their overall tax obligation through tax credits, the PATH Act provisions merely allow deductions in taxable income—a comparatively small tax benefit.⁷⁰ On the whole, these and other existing federal tax policies do not do enough to incentivize waste producers to donate leftover food.⁷¹

4. *Uniform Open Dating Regulation*

The federal government has likewise done relatively little to regulate food date labeling in ways that discourage food waste. Although the FDA and the USDA have the power to regulate date labeling, neither does. Therefore, manufacturers retain discretion to apply the “best by,” “sell by,” and other date labels to their products, resulting in a product date label free-for-all. This can lead to food waste at the consumer level because many consumers erroneously believe that consuming food past the label date is a safety risk. Accordingly, many consumers waste edible wholesome food due to unfounded safety concerns. Many retailers are likewise legally prohibited from selling food past its label date.⁷² Consumer and retailer overreliance on these unregulated date labels results in a substantial amount of wasted food.⁷³

Despite its authority to regulate product date labeling, the United States government relies on voluntary date labeling schemes. The Uniform Open Dating Regulation (UODR) exemplifies this reliance.⁷⁴ The UODR, created in part by the National Institute of Standards and Technology, established model regulations on date labeling with the goal of achieving standardization and consistency across jurisdictions.⁷⁵ However, adherence to the model is voluntary and only five states

68. *Id.* at 16–17 (“The enhanced deduction . . . allow[s businesses] to deduct the smaller of . . . twice the basis value of the donated food or . . . the basis value of the donated food plus one-half of the food’s expected profit margin. . . .”).

69. *Id.* at 17 (“First, the donee (food recovery organization) must be an IRC 501(c)(3) organization, and a public charity or a private operating foundation. Second, the donee must use the donated property solely for the care of the ill, the needy, or infants, in a manner consistent with the purpose constituting that organization’s exempt status under IRC 501(c)(3). Third, the donee may not use or transfer the food in exchange for money, other property, or services. Fourth, the donee must provide a written statement to the donor stating that all requirements of IRC 170(e)(3) have been met. Fifth, the donated food must be in compliance with the Food, Drug, and Cosmetic Act (FDCA) at the time the donation is made, as well as for 180 days before the contribution.”).

70. *See id.* at 19–20.

71. *See id.*

72. *See id.* at 29.

73. *See id.* at 26–27.

74. *See* LEIB ET AL., *supra* note 32, at 11.

75. *Id.* The National Institute of Standards and Technology (NIST) is a research and advisory agency of the U.S. Department of Commerce. NIST collaborated with the nonprofit National Conference on Weights and Measures to create the Uniform Open Dating Regulation. *Id.*

had adopted it as of 2013.⁷⁶ The lack of clear federal regulation causes a spread of misinformation and creates inconsistency between states, which interferes with interstate commerce.⁷⁷ Consequently, if companies incur higher costs from altering labels for products that are sold across state lines, the price of food is likely to increase.⁷⁸

B. Federal Policies that Unintentionally Promote Food Waste

Some federal policies that regulate food production, meal programs, and food safety also inadvertently contribute to the food waste problem in the United States. For example, the Farm Bill, discussed below, encourages farmers to produce excessive quantities of food, much of which often goes to waste. Other policies, such as federal food safety guidelines and the law authorizing federal funding for school meal programs, promote unnecessary food waste as well.

1. *The Farm Bill: Agricultural Adjustment Act of 2014*

Large quantities of food are wasted at the agricultural level each year because some farmers overplant crops to secure government-guaranteed benefits.⁷⁹ The nation's first Farm Bill,⁸⁰ the Agricultural Adjustment Act of 1933, was enacted to stabilize agricultural markets and promote farmland stewardship by encouraging farmers not to over-produce.⁸¹ However, the Farm Bill has evolved in form and function since the 1930s and now provides extensive financial protections to farmers that often have the opposite effect.⁸² One of the most controversial Farm Bill protections is crop insurance, which accounts for almost sixty-three percent of the USDA's budgeted outlay for farm subsidies. Crop insurance serves as a risk management tool for farmers that protects against losses in yield, crop revenue, and whole farm revenue.⁸³

Because crop insurance protects farmers against a wide variety of risks, it acts as a substantial subsidy to crop production.⁸⁴ By providing generous subsidies

76. *Id.* These five states were Arkansas, Connecticut, Nevada, Oklahoma, and West Virginia. *Id.*

77. *Id.* at 7 (“Food lawyers [in the 1970s] recognized that the proliferation of inconsistent state laws could affect interstate commerce . . . and hinted at the idea that it could inflate the price of food, reiterating the initial concern raised by supermarket chains that open labeling would lead to food waste and higher food prices.”).

78. *See id.* (“For example, costs would go up if food companies needed to use separate packaging lines for products entering each jurisdiction in order to comply with divergent state laws.”).

79. *See generally* Carl H. Nelson & Edna T. Loehman, *Further Toward a Theory of Agricultural Insurance*, 69 AM. J. AGRIC. ECON. 523, 523 (1987).

80. *Farm Bill: A Short History and Summary*, FARM POL’Y FACTS, <http://www.farmpolicyfacts.org/farm-policy-history/> (last visited Oct. 17, 2016).

81. *Id.*

82. Nelson & Loehman, *supra* note 79, at 523.

83. *See* DANIEL A. SUMNER & CARL ZULAUF, ECONOMIC & ENVIRONMENTAL EFFECTS OF AGRICULTURAL INSURANCE PROGRAMS 3, 5 (2012). “[Subsidized crop insurance c]overage is now available in every state and insurance is offered for every major agricultural commodity produced domestically.” JEFFREY T. LAFRANCE ET AL., THE ENVIRONMENTAL IMPACTS OF SUBSIDIZED CROP INSURANCE: CROP INSURANCE & THE EXTENSIVE MARGIN § 2 (2002), <https://pdfs.semanticscholar.org/95ea/51b87c1c930b1dd646f81e681a321d6ca160.pdf>.

84. SUMNER & ZULAUF, *supra* note 83, at 7.

to farmers and compensating them for losses, crop insurance increases the amount of income farmers can expect to receive per planted acre.⁸⁵ This emphasis on productivity incentivizes farmers to plant as much as possible, even when doing so results in overplanting.⁸⁶ Crop insurance essentially promotes overproduction and is, in that sense, another major contributor to food waste.⁸⁷

2. Marketing Orders

Federal marketing orders, which restrict the quantity and quality of saleable food for some food commodities in the United States, also contribute to food waste. Federal marketing orders, promulgated pursuant to the Agricultural Marketing Adjustment Act of 1937 (AMAA), regulate the sale of various agricultural commodities in an effort to control prices.⁸⁸ Among other things, the AMAA allows the federal government to restrict the quantity of a commodity that can be sold and regulate the grade, size, or quality of the commodity through marketing orders.⁸⁹ Under this structure, the federal government can require certain fruit, nut, and vegetable growers to limit the quantity and type of crops they sell.⁹⁰

Marketing orders can contribute to food waste because they effectively direct producers to waste crops subject to an order.⁹¹ For example, in 2009 alone, farmers allowed thirty million pounds of tart cherries to rot because a marketing order prohibited them from selling the entirety of their yield.⁹² Furthermore, marketing orders have been extremely controversial for reasons apart from their wasteful nature. For example, the Supreme Court determined in the 2013 case *Horne v. Department of Agriculture*⁹³ that a raisin marketing order's supply restrictions constituted a taking of private property and thus required just compensation to producers. From a food waste perspective, marketing orders are

85. See generally Dan Charles, *Farm Subsidies Persist and Grow, Despite Talk of Reform*, NPR (Feb. 1, 2016), <http://www.npr.org/sections/thesalt/2016/02/01/465132866/farm-subsidies-persist-and-grow-despite-talk-of-reform>. The Congressional Budget Office estimated that government aid to farmers would rise to \$23.9 billion in 2017. *Id.*

86. SUMNER & ZULAUF, *supra* note 83, at 12; Scott Faber, *Crop Insurance: Bad for Taxpayers, Bad for the Environment*, AGMAG (July 13, 2012), <http://www.ewg.org/agmag/2012/07/crop-insurance-bad-taxpayers-bad-environment>.

87. Similarly, by reducing the chance of economic loss, crop insurance lessens the incentive to implement risk-mitigating production practices. SUMNER & ZULAUF, *supra* note 83 at 12.

88. Daniel Bensing, *The Promulgation and Implementation of Federal Marketing Orders Regulating Fruit and Vegetable Crops Under the Agricultural Marketing Agreement Act of 1937*, 5 SAN JOAQUIN AGRIC. L. REV. 3, 3 (1995). See generally *id.* at 5–9.

89. *Id.* at 6–7.

90. See, e.g., *Commodities Covered by Marketing Orders*, U.S. DEP'T AGRIC., <https://www.ams.usda.gov/rules-regulations/moa/commodities> (last visited Feb. 4, 2018). Currently, the USDA has marketing orders for the following commodities: almonds, apricots, avocados, sweet and tart cherries, citrus (in Florida and Texas), cranberries, dates, grapes, hazelnuts, kiwifruit, olives, onions (in Idaho; Eastern Oregon; South Texas; Vidalia, Georgia; and Walla Walla, Washington), pears (in Oregon and Washington), pecans, pistachios, plums/prunes (in California), potatoes (in Idaho, Eastern Oregon, Washington, Colorado, Virginia, and North Carolina), raisins, spearmint oil, tomatoes, and walnuts. *Id.*

91. Elayne Allen & Daren Bakst, *How the Government Is Mandating Food Waste*, DAILY SIGNAL (Aug. 19, 2016), <http://dailysignal.com/2016/08/19/how-the-government-is-mandating-food-waste/>.

92. *Id.*

93. *Horne v. Dep't of Agric.*, 133 S. Ct. 2053 (2013).

among the most egregious actions a government can take because they result in large quantities of valuable food going to waste.

3. *Healthy, Hunger-Free Kids Act*

Public school cafeteria policies inadvertently account for a substantial amount of wasted food in the United States as well. Although there are many factors that contribute to the food waste problem in schools, the Healthy, Hunger-Free Kids Act (HHFKA) is at least partly to blame. Enacted in 2010, HHFKA expanded funding for child nutrition and free school lunch programs and required the USDA to update nutrition standards for meals served through the National School Lunch Program and School Breakfast Program.⁹⁴

Although HHFKA's primary goal was to provide access to nutritious food for public school children, the statute has been criticized for creating even more food waste by requiring children to take fruits and vegetables they do not want and ultimately throw them away.⁹⁵ Studies showed that students threw away sixty to seventy-five percent of the vegetables and forty percent of the fruits on their trays, resulting in an almost one hundred percent increase in food waste in the school cafeteria setting.⁹⁶ This food waste generated a financial burden as well: roughly \$3.8 million of unwanted produce was thrown out daily—an annual loss of \$684 million.⁹⁷

4. *FDA Food Code*

The Food and Drug Administration (FDA) Food Code arguably perpetuates food waste at the consumer level as well by inadequately educating consumers on how to read food date labels. The Food Code, established every four years by the FDA, contains advice for protecting food safety and human health.⁹⁸ Many states have voluntarily adopted the Food Code's recommendations for food preparation and spoilage guidelines.⁹⁹

Unfortunately, the Food Code's limited scope does a disservice to American consumers seeking to conserve food because it only models date labeling for three different food types: refrigerated, ready-to-eat potentially hazardous food; shellfish; and food in reduced oxygen packaging.¹⁰⁰ The Food Code provides little or no guidance on labeling for other foods, requiring consumers to guess what the

94. Krista L. Thyberg & David J. Tonjes, *Drivers of Food Waste and Their Implications for Sustainable Policy Development*, 106 RESOURCES, CONSERVATION & RECYCLING 110, 117 (2016) (noting that the Act "required USDA to update nutrition standards of the National School Lunch and Breakfast Program" and that the Department's updated standard "emphasized nutritional quality improvements for student meals"). Although Congress has yet to officially reauthorize the program, its funding will remain intact unless Congress votes to repeal it completely.

95. *Id.*

96. See Press Release, Sch. Nutrition Ass'n, *Myth vs. Fact on Healthy, Hunger-Free Kids Act School Meals Implementation* (May 22, 2014), https://schoolnutrition.org/uploadedFiles/News_and_Publications/Press_Releases/Press_Releases/Myth%20vs%20Fact.pdf.

97. *Id.*

98. See generally LEIB ET AL., *supra* note 32, at 11–12.

99. *Id.* at 11–12. Thirteen states have adopted language almost identical to the Food Code's shellfish date labeling provision. *Id.* at 12.

100. *Id.* at 12.

“sell by” or “best if used by” dates mean on most food products. As discussed, consumer confusion regarding food dates contributes to the premature disposal of large quantities of edible foods. The problems that plague the Food Code seem to be the inverse of the UODR, discussed above, as the Food Code reaches a sufficient amount of consumers, but provides insufficient information.

C. Federal Plans to Salvage the Waste: Proposed Legislation

Although existing federal food waste and recovery policies in the United States fall short, federal-level policymakers have introduced bills in recent years that could better address the problem. The Food Waste Accountability Act is one example of these efforts. To better account for the amount of food wasted at the federal level, California Representative Jerry McNerney introduced the Food Waste Accountability Act into the House of Representatives in 2016, where it was referred to the House Committee on Oversight and Government Reform.¹⁰¹ The Act would amend the Federal Food Donation Act of 2008 to require federal contractors to submit an annual report detailing the weight of food donated, composted, or discarded.¹⁰² Such requirements would heighten transparency and more accurately pinpoint the largest sources of national food waste.

Maine Representative Chellie Pingree recently introduced a comprehensive food waste bill into the House that also seeks to increase recovery of food waste before it reaches the landfill. The Food Recovery Act¹⁰³ aims to reduce food waste at farms, restaurants, retailers, schools, military food-service providers, and homes. If enacted into law, the bill would direct the USDA to study new technologies to increase food shelf life and would fund the creation of additional large-scale composting and waste collection infrastructure.¹⁰⁴ The Act would also fund public education campaigns and projects, such as construction of anaerobic digesters, to keep food waste out of the landfill.¹⁰⁵

Representative Pingree also joined forces with Connecticut Senator Richard Blumenthal to introduce bicameral legislation in the House and Senate to establish a uniform national date labeling system.¹⁰⁶ The Food Date Labeling Act would create a uniform national date labeling standard that eliminates disparate labeling standards between states and helps businesses comply with food health and sanitation standards.¹⁰⁷ A uniform date labeling standard would likewise reduce the food waste and economic losses that occur every year when Americans discard

101. Food Waste Accountability Act of 2016, H.R. 4382, 114th Cong. (2016).

102. *Id.*

103. Food Recovery Act of 2015, H.R. 4184, 114th Cong. (2015).

104. *See id.* §§ 104, 403.

105. *See id.* §§ 101(b), 303. Anaerobic digesters can be used to convert crop waste into energy. *See id.* § 101(b).

106. Press Release, Senator Richard Blumenthal, Blumenthal, Pingree Introduce Commonsense Bill to Standardize Food Date Labeling (May 18, 2016), <https://www.blumenthal.senate.gov/newsroom/press/release/blumenthal-pingree-introduce-commonsense-bill-to-standardize-food-date-labeling>.

107. Food Date Labeling Act of 2016, H.R. 5298, 114th Cong. (2016); *see* Blumenthal, *supra* note 106.

tons of still edible, nutritious food due to unclear and inconsistent food date labeling.¹⁰⁸

Introduced into the House by Ohio Representative Marcia Fudge, the Food Donation Act of 2017 (H.R. 952) seeks to amend the Child Nutrition Act of 1966 and expand food donation under the GSA.¹⁰⁹ Under the Food Donation Act, apparently fit grocery products and apparently wholesome foods would be redefined as those that meet “safety and safety-related” labeling requirements under state and local laws rather than those that merely satisfy “quality” requirements. It would also permit donors to recuperate some of their costs by selling wholesome food at a “good Samaritan reduced price.”¹¹⁰ However, the Food Donation Act would still require donors to deliver excess food to qualified recipients to obtain liability protection, rather than extending the protection to donations to hungry individuals. Whether any of these bills will have success in Congress will soon be seen. If they do become law, they will have the potential to effectuate substantial reductions in food waste in the United States.

D. State-Level Efforts to Reduce Food Waste

Perhaps in recognition of inadequate federal solutions to the food waste problem, many states have implemented their own food waste policies. These policies cover a broad spectrum of strategies as diverse as the states themselves. Unfortunately, these state policies also vary in effectiveness.

To date, Vermont has the most aggressive food waste policies in the United States. With the enactment of Act 148 (Universal Recycling Law) in 2014, Vermont became the first state to ban food scraps in landfills.¹¹¹ The Universal Recycling Law requires all state residents to separate food waste from trash and recyclables by 2020 and authorizes sanctions on non-cooperative consumers.¹¹² Another relatively new Vermont law requires all persons living within twenty miles of a certified organic waste facility to dispose of food waste at the facility.¹¹³

Although Vermont’s food waste laws seem to have garnered success in that state, they may not be successful or even politically acceptable in many other states. For example, more politically conservative states might resist heavy-handed governmental involvement into their decisions about personal trash and thus may be reluctant to participate due to privacy concerns.

108. H.R. 5298 § 2.

109. Food Donation Act of 2017, H.R. 952, 115th Cong. (2017).

110. *Id.* A “good Samaritan reduced price” is “an amount not greater than the cost of handling, administering, and distributing such apparently wholesome food or apparently fit grocery product.” *Id.*

111. Kathryn Flagg, *Mandatory Composting: Coming Soon to a Trash Can Near You*, SEVEN DAYS (Apr. 30, 2014), <http://www.sevendaysvt.com/vermont/mandatory-composting-coming-soon-to-a-trash-can-near-you/Content?oid=2359984>. See generally *Act 148: Universal Recycling and Composting Law*, CHITTENDEN SOLID WASTE DISTRICT, <http://cswd.net/about-cswd/universal-recycling-law-act-148/> (last visited Sept. 5, 2016).

112. Flagg, *supra* note 111.

113. See Nicholas M. Vaz, *Are You Gonna Eat That?: A New Wave of Mandatory Recycling Has Massachusetts and Other New England States Paving the Way Toward Feasible Food Waste Diversion and a New Player in Alternative Energy*, 26 VILL. ENVTL. L.J. 193, 201 (2015).

States may likewise lack the infrastructure, or funding to develop the necessary infrastructure, to support a mandatory composting system. In fact, composting infrastructure development and operation costs are difficult to justify in most of the United States.¹¹⁴ It is estimated that municipal solid waste composting systems cost around \$50 per ton to operate, which is significantly more than a solid waste management system that does not involve composting.¹¹⁵ Areas that implement mandatory composting policies would have to invest in expensive collection vehicles or separation equipment and find additional space to store collected food waste.

Other states, such as Colorado, take a very different approach to regulating food policy within their borders. Unlike Vermont, Colorado has not enacted a specific composting policy aimed at reducing food waste. However, the state has used its legislative authority to create the Colorado Food Systems Advisory Council (COFSAC).¹¹⁶ COFSAC is a group of fifteen volunteer members with both governmental and non-governmental backgrounds. COFSAC provides guidance to lawmakers, advocates for increased availability and consumption of healthy foods, and collaborates with food policy councils across the state to present policy solutions to the Colorado General Assembly.¹¹⁷

The public-private partnership that exists in Colorado appears to be a much more casual approach to food waste policy than Vermont's more coercive style and may be more acceptable to other states. However, because COFSAC is a non-governmental volunteer organization with a purely advisory role, it lacks authority to implement food waste policy on its own. Its success thus depends on the legislature's willingness to adopt its recommendations, a factor that will determine whether groups like COFSAC are effective at fulfilling their objectives.

Oregon takes an entirely different approach to food waste policy by employing economic incentives to encourage the voluntary donation of excess food. Oregon's Crop Donation Tax Credit incentivizes farmers to glean¹¹⁸ their fields and donate the gleaned crops by providing a tax credit for fifteen percent of the donated food's fair market value.¹¹⁹ Despite this tax credit, Oregon's donation system is often criticized because it does not remove barriers that prevent farmers from donating food. These barriers generally include packaging and transportation

114. See M. Renkow & A.R. Rubin, *Does Municipal Solid Waste Composting Make Economic Sense?*, 53 J. ENVTL. MGMT. 339, 345–46 (1998) (“[A]t present, [municipal solid waste] composting cannot be justified on financial grounds in most US locations . . . even when the economic benefits of extending landfill life [by diverting food waste] are considered.”).

115. *Id.* at 343–44. Operation of a traditional municipal solid waste system costs around \$34 per ton in most parts of the country. *Id.* at 344.

116. *About COFSAC*, COLO. FOOD SYSTEMS ADVISORY COUNCIL, <http://www.cofoodsystems.council.org/> (last visited Feb. 25, 2018).

117. *Id.*

118. Gleaning involves gathering what reapers or gatherers have left at harvest. *Gleaning*, WEBSTER'S NEW INT'L DICTIONARY (2d ed. 1939)

119. Carol McAlice Currie, *Governor Signs Crop-Donation Tax Credit*, STATESMAN J. (Apr. 24, 2014, 4:48 PM PT), <http://www.statesmanjournal.com/story/news/politics/2014/04/24/governor-signs-crop-donation-tax-credit/8124925/>.

costs, the investment of time to deliver crops to food banks, and the overall cost of planting and harvesting.¹²⁰

Dissimilarities between states' food conservation policies present obstacles to the effective reduction of food waste. The patchwork of state-level food waste laws can complicate the food waste reduction efforts of businesses operating across state borders.¹²¹ A lack of federal support for many of these programs can similarly impede their success.

E. Unintended Consequences: State Policies That Inadvertently Promote Food Waste

Although numerous states have enacted laws to reduce food waste, several states have strict food policies that actually contribute to the food waste problem. For example, a Montana law that forbids the sale of milk after twelve days past pasteurization contributes to unnecessary waste at the consumer level and at all other levels in the milk supply chain.¹²² Massachusetts, likewise, has some of the strictest food laws in the country that inadvertently encourage food waste.¹²³ One of these laws requires that date labels be based on optimal freshness timelines chosen by manufacturers, rather than on food safety risks. If one wishes to donate past-date food free from liability, the would-be donor must ensure that the food meets additional criteria.¹²⁴ Donated food must be "wholesome," with its sensory qualities not "significantly diminished." Further, the past-date food must be separated from foods that are not past date, and it must be clearly marked as being for sale after the date recommended on its label.¹²⁵ As a result, Massachusetts's date labeling requirements promote disposal of wholesome food and do little to facilitate food donations.

F. Municipal Food Waste Reduction Ordinances

Some cities have also implemented their own ordinances and codes to discourage food waste. In 2013, New York City enacted an ordinance requiring certain commercial facilities to compost excess food.¹²⁶ San Francisco passed an ordinance in 2009 requiring composting in an effort to meet a goal of "zero waste by 2020."¹²⁷ Similarly, the Seattle Municipal Code prohibits the city's residents and businesses from putting food scraps, yard waste, compostable paper, or recyclables in their garbage. The city of Austin updated its Universal Recycling

120. *Id.*

121. See LEIB ET AL., *supra* note 32, at 7.

122. MONT. ADMIN. R. 32.8.202 (2000).

123. HARV. FOOD L. & POL'Y CLINIC, *Legal Fact Sheet for Massachusetts Food Donation: Date Labeling Laws*, HARV. FOOD L. & POL'Y CLINIC 1 (July 2015), <http://www.mass.gov/eea/docs/dep/public/committee-4/harvard-fs.pdf>.

124. *Id.* at 2.

125. *Id.*

126. Christopher Peterson, *Mandatory Compost Laws Update: New York City, San Francisco, Massachusetts, and Vermont*, AGRIC. MGMT. COMMITTEE NEWSL. (A.B.A., Chicago, Ill.), Sept. 2014, at 3.

127. *Id.*

Ordinance in 2014 to include organics (such as food scraps and food-soiled paper), and the city created a rebate program in 2016 for residents who purchased home composting equipment.¹²⁸

Although attempts to mitigate food waste at the local level are laudable, there are some downsides to this approach. There is great inconsistency between different cities' policies and between city and state policies. Food producers may thus find it difficult to comply with varying policies, which can adversely impact economic growth and present obstacles to enforcement.¹²⁹ For example, the city of Baltimore prohibits the sale of perishable food past its expiration date, even though the state of Maryland has no such law.¹³⁰ These inconsistencies can cause confusion for businesses trying to operate within a city's borders and consumers making food safety choices at home.

Hoping to avoid inconsistencies among local laws, some states have gone so far as to bar municipalities from enacting certain types of food regulations. Statutes in Minnesota and Ohio preempt local food date labeling ordinances, leaving such laws purely under state control.¹³¹ These preemption statutes may promote greater consistency within state borders, but they also preclude municipalities from engaging in valuable experimentation with new food waste reduction policies.

Moreover, cities must provide the necessary support systems to facilitate consumer compliance with waste-reduction policies. For example, municipal composting regulations that are not coupled with easily accessible composting facilities will be ineffective. A lack of residential composting infrastructure is a significant barrier for cities trying to implement composting requirements. Therefore, if cities wish to require residents to compost food waste, they must first provide the necessary infrastructure.¹³²

G. Eyes Off the Prize: Cities Unintentionally Promoting Food Waste Within their Borders

Like the federal and state food safety policies discussed above, some municipal food safety ordinances also contribute to wasted food.¹³³ Numerous cities have adopted regulations on food donation activities. Ordinances in Myrtle Beach, St. Louis, and Pasadena restrict food sharing due to food safety concerns.¹³⁴ In 2013 to 2014 alone, twelve cities adopted ordinances that required individuals or

128. Lynn Brinkley, *Austin, TX – Universal Recycling Ordinance*, INST. LOCAL SELF-RELIANCE (May 10, 2016), <https://ilsr.org/rule/food-scrap-ban/austin-tx-universal-recycling/>.

129. *Cf.* LEIB ET AL., *supra* note 32, at 7 (discussing historical and current concerns regarding inconsistencies created by the state-driven piecemeal approach to date labeling legislation).

130. *Id.* at 15.

131. *Id.*

132. *See supra* notes 114–15 and accompanying text for a discussion of the obstacles states may encounter when purchasing and creating infrastructure for municipal solid waste composting.

133. *See supra* notes 72–78, 98–100 and accompanying text for a discussion of state and federal food safety policies that inadvertently contribute to food waste.

134. *See* NAT'L COAL. FOR THE HOMELESS, *SHARE NO MORE: THE CRIMINALIZATION OF EFFORTS TO FEED PEOPLE IN NEED* 14–15 (Michael Stoops ed., 2004), <http://nationalhomeless.org/wp-content/uploads/2014/10/Food-Sharing2014.pdf>.

organizations to obtain permits before distributing food on public property.¹³⁵ These permit requirements place administrative and financial obstacles in the way of citizens and businesses that seek to distribute excess food to those in their communities who need it most.¹³⁶ Pasadena's ordinance further requires that donated hot food be prepared in approved locations,¹³⁷ creating yet another barrier for organizations that want their leftovers to feed hungry mouths rather than fill their trash bins.

H. Consumer Forces and Private Governance Efforts to Reduce Food Waste

In addition to federal, state, and local governments, some non-governmental actors in the United States have taken actions aimed at reducing food waste. Unfortunately, these private actors also face numerous hurdles and are subject to resource constraints similar to those of their public counterparts. Some private industry practices aimed primarily at satisfying consumer demands unintentionally promote the nation's food waste problem.

Private food policy councils have had some success tackling food waste issues, but they remain restricted by their limited resources and influence. Food policy councils (FPCs) are entities that perform a wide range of functions in the areas of food policy, advocacy, and education. Among other things, these groups draw public attention to problems that can be addressed through policy, develop policy proposals, lobby for specific legislation, and support community gardens and farmers markets.¹³⁸ FPCs currently exist in forty-five states, the District of Columbia, and numerous localities; they are usually comprised of non-governmental actors, but in some places they work directly with local and state governments.¹³⁹

Although FPCs are willing to combat unjustifiable food waste, they face resource constraints and may lack the training or skills needed to successfully influence policy.¹⁴⁰ Government employees who are FPC members may also be reluctant to take positions on policy issues, as some government employees are prohibited from using their position for their own private gain or to advance the position of organizations with which they are affiliated.¹⁴¹ This may further limit the resources available to these groups to effectuate actual change.¹⁴²

Private trade groups have likewise made efforts to reduce food waste in the United States. In February 2017, the nation's two largest grocery industry trade groups, the Food Marketing Institute and the Grocery Manufacturers Association,

135. *Id.* at 4.

136. *See id.* at 4, 8–13.

137. *Id.* at 15.

138. AMANDA ESSEX ET AL., NAT'L CONFERENCE OF STATE LEGISLATURES, HARVESTING HEALTHIER OPTIONS: STATE LEGISLATIVE TRENDS IN LOCAL FOODS 37 (2015), <http://www.ncsl.org/Portals/1/Documents/enviro/HarvestingHealthierOptions.pdf>.

139. *Id.* at 36–37.

140. *See id.* at 37.

141. *See, e.g., Misuse of Position and Government Resources*, U.S. DEP'T JUST., <https://www.justice.gov/jmd/misuse-position-and-government-resources> (last updated May 18, 2016).

142. *See* ESSEX ET AL., *supra* note 139, at 37.

announced their adoption of voluntary standards for product date labels.¹⁴³ These standards encourage manufacturers to use two different food label phrases only: “use by” and “best if used by.”¹⁴⁴ The “use by” label indicates when foods are no longer safe to consume, whereas the “best if used by” label describes the product’s quality and indicates the manufacturer’s determination as to when it should be consumed for optimal quality.¹⁴⁵

Unfortunately, these standards share deficiencies that plague the UODR and other voluntary date labeling schemes. In particular, since these standards are created privately and lack legal force, manufacturers are again not required to implement them.¹⁴⁶ Further, these standards do not appear to incorporate a consumer education component, so they do little to mitigate the high volume of food waste caused by consumers discarding food based on groundless safety concerns.¹⁴⁷

It is also worth noting that consumer expectations about how their food should look contribute to the unjustified disposal of wholesome, nutritious food at supermarkets, restaurants, and dining rooms. Many retail shoppers shun “aesthetically challenged” or “ugly” produce that do not fit their narrow views of how an apple or a peach *should* look.¹⁴⁸ Understandably, many retailers strive to display aesthetically pleasing foods only,¹⁴⁹ and foods that fail to measure up to aesthetic standards often end up in the dumpster.

Restaurants similarly cater to consumer demands by seeking to serve only dishes that are pleasing to diners’ eyes, regardless of their wholesomeness. These pressures cause restaurants to seek out attractive produce from their wholesale and retail partners and reject ugly yet nutritious produce that might otherwise spice up their menus.¹⁵⁰ A small but growing number of retailers, restaurants, and other organizations are beginning to embrace ugly food as a method to combat the

143. Press Release, Grocery Mfrs. Ass’n, Grocery Industry Launches New Initiative to Reduce Consumer Confusion on Product Date Labels (Feb. 15, 2017), <http://www.gmaonline.org/news-events/newsroom/grocery-industry-launches-new-initiative-to-reduce-consumer-confusion-on-pr/>.

144. Caitlin Dewey, *You’re About to See a Big Change to the Sell-by Dates on Food*, WASH. POST (Feb. 16, 2017), https://www.washingtonpost.com/news/wonk/wp/2017/02/16/a-barely-noticeable-change-to-how-food-is-labeled-could-save-americans-millions/?utm_term=.17582f7a0e26.

145. *Industry Introduces National Guidance for Standard Date Labels to Reduce Confusion and Food Waste*, CTR. FOR HEALTH L. & POL’Y INNOVATION (Feb. 15, 2017), <http://www.chlpi.org/industry-introduces-national-guidance-for-standard-date-labels-to-reduce-confusion-and-food-waste/>.

146. *See id.*

147. *See Dewey, supra* note 145.

148. The retail industry has termed food fit for consumption but not for sale “unsaleable food.” FOOD WASTE REDUCTION ALL., ANALYSIS OF U.S. FOOD WASTE AMONG MANUFACTURERS, RETAILERS, AND RESTAURANTS 9 (2016), http://www.foodwastealliance.org/wpcontent/uploads/2014/11/FWRA_BSR_Tier3_FINAL.pdf. A few examples of unsaleable foods include irregularly shaped produce, day-old bread, mislabeled items, or food in damaged packing.

149. *See* Kristofor Husted, *Supermarkets Waste Tons of Food as They Woo Shoppers*, NPR (Sept. 25, 2014, 5:09 PM ET), <http://www.npr.org/sections/thesalt/2014/09/25/351495274/supermarkets-waste-tons-of-food-as-they-woo-shoppers>. Missouri grocery store director Paul Hoppman reaffirms his experience with this dilemma: “[It’s a] perfectly good banana . . . [but] it won’t sell because it just doesn’t look good.” *Id.*

150. *See* Dan Mitchell, *Why People Are Falling in Love with “Ugly Food,”* TIME (Mar. 27, 2015), <http://time.com/3761942/why-people-are-falling-in-love-with-ugly-food/>.

nation's food waste.¹⁵¹ However, most do not. Significant opportunities remain to encourage increased demand for safe-yet-ugly food items.¹⁵²

III. THE FRAMEWORK: COST-JUSTIFIABLE STRATEGIES TO FURTHER REDUCE FOOD WASTE IN THE UNITED STATES

Despite the federal, state, and local laws and policies just described, businesses and households across the United States continue to waste enormous amounts of food every day.¹⁵³ In part because of poor public participation, a lack of efficient indicators to monitor performance, and uncertainty regarding policy outcomes, food waste continues to be a major problem throughout the country.¹⁵⁴ To guide policymakers' efforts to create effective food waste policies, we have developed a framework built on a basic cost-benefit model. We apply this conceptual framework to weigh private and social costs and benefits of reducing food waste. The following examples provide theoretical scenarios that illustrate the relative costs and benefits of reducing food waste at each stage of the food supply chain.

Given the high enforcement costs and privacy issues associated with aggressive food waste regulation at the consumer level, policy efforts aimed at the nation's largest food producers are likely the most promising means of efficiently addressing the nation's food waste problem.¹⁵⁵ Meaningful reductions in food waste are also more likely to occur if there is a market for excess food and if state and federal legislatures thoughtfully tailor policies to fit unique characteristics of parties at each stage of the food supply chain.

From a microeconomics perspective, the optimum quantity of food waste reduction in any given context is a function of the private and social costs and benefits attainable from those efforts. The *private* costs associated with reducing food waste generally encompass transportation costs, food waste processing costs, additional liability risks, and expended time and attention. Meanwhile, the *private* benefits of food waste reduction activities tend to be primarily the revenues earned from sales of excess foods or their by-products. However, food waste reduction efforts generate various other *social* benefits that do not necessarily accrue to market decision-makers. Examples of these social benefits include energy and water conservation, reduced hunger, and general economic development. Because individuals and businesses that could reduce food waste do not directly internalize these benefits, new policies are needed to create benefits they can internalize.¹⁵⁶

Government programs that strengthen and support private markets for food waste and food waste by-products could play a role in helping food waste

151. *See id.*

152. *See* Husted, *supra* note 150.

153. Thyberg & Tonjes, *supra* note 94, at 111.

154. *Id.* at 121.

155. *See* Buzby & Hyman, *supra* note 16, at 568 (noting that, because the inherent difficulty in changing consumer behavior stands as an obstacle to the efficacy of policies aimed at reducing consumer-level food waste, "it is the large, industry-led initiatives or government-led policies which have the greatest potential to reduce food loss in the next decade").

156. *See generally* JAMES R. KEARL, PRINCIPLES OF ECONOMICS (1993) (discussing general concepts of costs, benefits, and externalities).

reducers internalize more of the benefits of those practices.¹⁵⁷ Among other things, market-building strategies could better connect producers of usable food waste with potential users and thus increase market prices for those products.¹⁵⁸ Programs that motivate consumers to more aggressively demand that retailers and other food waste producers adopt waste-conscious practices could also drive even further waste reduction throughout the food supply chain.¹⁵⁹

Market-building policy strategies will not eliminate excess food waste on their own.¹⁶⁰ Therefore, legislative approaches such as tax benefits, block grants, limited liability guarantees, subsidies, regulatory prohibitions, and corrective taxes could all help to reduce the inefficient wasting of food. In particular, economic considerations drive most decisions about food waste in the food supply chain, so policy approaches that materially impact businesses' and citizens' incentives to reduce food waste are likely to be the most powerful and efficient means of changing stakeholder behavior.¹⁶¹

Moreover, policy strategies aimed at reducing food waste are most likely to be effective if implemented at the appropriate government level. One challenge, therefore, is to optimally allocate regulatory authority across the federal, state, and local levels of government based on each level's own unique potential benefits and costs of regulation.¹⁶² Because the geographic scope of food waste-related externalities varies, some types of food waste policies will be best implemented through lower levels of government, whereas others may warrant federal government involvement.¹⁶³

As suggested above, the justifiability of government regulation in any given context hinges in part on the administrative and enforcement costs associated with implementing and enforcing it. The enforcement costs of a new law requiring agricultural, institutional, or industrial users to reduce waste are likely to be relatively low given that most of these actors are already heavily regulated in other ways and are relatively few in number. In contrast, the implementation and enforcement costs of imposing equivalent food waste reduction requirements on

157. *Cf., e.g.*, Christopher Helman, *Rethinking Recycling: Not All of Your Trash Has Value*, FORBES, Oct. 4, 2016, at 52 (discussing the value in waste and how markets affect the demand for recycled waste); *Recycling Means Business*, INST. FOR LOC. SELF-RELIANCE (Feb 1, 2002), <https://ilsr.org/recycling-means-business/> (same).

158. *See Helman, supra* note 158, at 52; *Recycling Means Business, supra* note 158.

159. *See generally* Thyberg & Tonjes, *supra* note 94 (encouraging consumers to compost waste may drive demand for construction of composting facilities).

160. *Cf.* Daniel B. Kelly, *Strategic Spillovers*, 111 COLUM. L. REV. 1641, 1672–73 (2011) (noting that “the typical concern” with respect to actors who engage in environmentally harmful behavior is that they “may not have an incentive to internalize the harm their activities [impose] on others”).

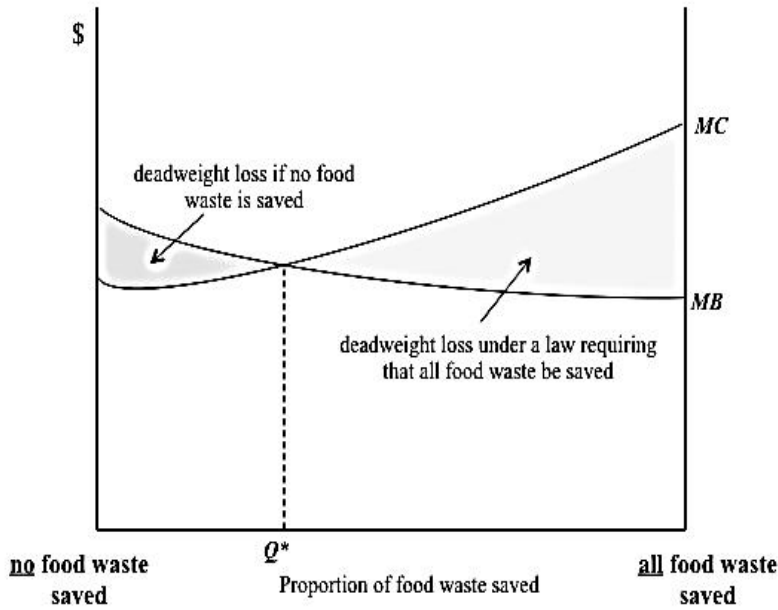
161. *See generally* PEKKA HUOVILA ET AL., BUILDINGS AND CLIMATE CHANGE: STATUS, CHALLENGES, AND OPPORTUNITIES 57 (2007), <http://www.unep.fr/shared/publications/pdf/DTIx0916xPA-BuildingsClimate.pdf>.

162. Henry N. Butler & Jonathan R. Macey, *Externalities and the Matching Principle: The Case for Reallocating Environmental Regulatory Authority*, 14 YALE L. & POL'Y REV. 23, 25 (Symposium Issue 1996).

163. *See generally* Jerome M. Organ, *Subsidiarity and Solidarity: Lenses for Assessing the Appropriate Locus for Environmental Regulation and Enforcement*, 5 U. ST. THOMAS L.J. 262, 266–67 (2008) (discussing factors that affect the determination of the most suitable level of government intervention).

every individual consumer in the country would be much higher because of the sheer number of consumers and adverse impacts on their privacy.¹⁶⁴ For these and other reasons, the costs and benefits associated with various types of waste reduction policies vary across the food supply chain. An ideal set of food waste regulations would perfectly account for these differences to generate an optimal quantity of food waste reduction. Figure 1 below illustrates the concept that the costs and benefits associated with reducing food waste can be used to analyze the optimum quantity of food waste at which intervention would be most successful at each stage of the supply chain.

Figure 1: Social Marginal Costs and Benefits of Reducing Food Waste¹⁶⁵



164. Amitai Aviram, *A Paradox of Spontaneous Formation: The Evolution of Private Legal Systems*, 22 YALE L. & POL'Y REV. 1, 23–24 (2004) (noting that as the size of the regulated class increases, enforcement costs inevitably increase).

165. This graphical representation, which we will apply and discuss throughout this section, is based on assumed costs and benefits of efforts to reduce food waste at each stage of the food supply chain. See generally KEARL, *supra* note 157.

The curve labeled “MC” in Figure 1 represents the Marginal Cost to individuals and society from food waste reduction efforts based on the quantity of excess food saved, ranging from recovery of no food waste to recovery of all food waste. The costs reflected in this curve include, among other things, governments’ enforcement costs and administrative costs associated with food waste reduction laws and such laws’ impacts on citizens’ privacy and freedom. The curve generally slopes upward because some food is easily recoverable with relatively little oversight. However, marginal costs increase as businesses, individuals, and governments proceed to “higher-hanging fruit” to generate each additional pound of saved food.

The curve labeled “MB” represents the Marginal Social Benefits to society of reducing food waste. These benefits include the market value of salvaged food but also include economic development benefits, environmental benefits, and other ancillary benefits associated with food waste reduction activities. This curve slopes downward to reflect the law of diminishing returns—the general notion that these marginal benefits are likely to diminish as the quantity of recovered food increases. At the intersection of MC and MB is Point Q^* , which represents the optimal quantity of food recovery in light of the marginal costs and benefits of food recovery activities.¹⁶⁶

Any deviation from the optimum set of food waste reduction policies generates economic inefficiency and consequent social welfare losses. This is illustrated in Figure 1, in part by the shaded area left of Q^* , which represents the deadweight loss under a scenario in which no food waste is saved. Deadweight loss is the cost to society that results from an inefficient allocation of resources.¹⁶⁷ This deadweight loss would result because, at all quantities of food waste recovery to the left of Q^* , the marginal benefits of saving food waste exceed the costs. Similarly, the lightly shaded area to the right of Q^* represents the deadweight loss under a system that requires recovery of all food waste. This social welfare loss would result because, at all quantities of food waste recovery to the right of Q^* , the marginal costs of saving food waste exceed the benefits of that activity. As stated above, an optimal regulatory regime for food waste recovery results in a quantity of food waste recovery equal to Q^* .¹⁶⁸ The challenge is determining which regulatory strategies are most likely to result in a quantity of food waste recovery that approximates Q^* .

Applying the foregoing microeconomic framework to consider the relative costs and benefits of various food waste reduction policy strategies we can identify the most cost-justifiable means of combatting this problem. The following subsections apply the framework at each major phase of the nation’s food supply

166. See generally *id.* (discussing marginal social costs and benefits associated with regulations that address externality problems).

167. *Deadweight Loss*, INVESTOPEDIA, <http://www.investopedia.com/terms/d/deadweightloss.asp> (last visited Aug. 28, 2017).

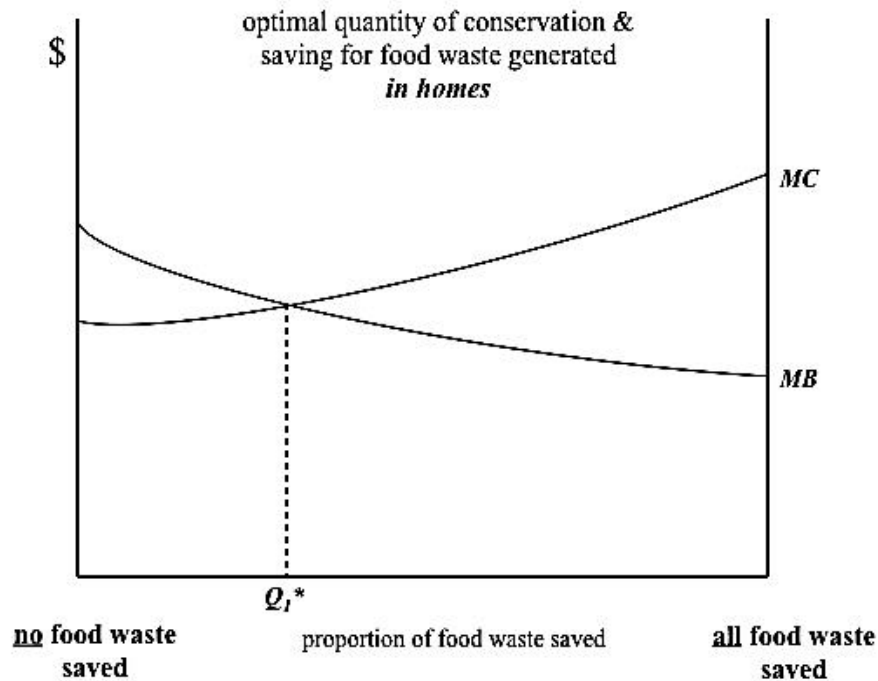
168. See generally MANAGING THE COMMONS 51–61 (John A. Baden & Douglas S. Noonan eds., 2d ed. 1998); NATURAL RESOURCE ECONOMICS: POLICY PROBLEMS AND CONTEMPORARY ANALYSIS 52–56 (Daniel W. Bromley ed., 1986) (explaining these principles, which will be applied throughout the rest of the paper).

chain, beginning with individual consumers and ultimately ending at the farms where food originates.

A. Reducing Individual Consumer and Residential Waste

Due to the relatively high costs and low benefits associated with reducing individual consumer food waste, policymakers should be judicious when contemplating policy changes aimed at increasing food waste reduction at this level. That said, food waste reduction policies aimed at consumers do have the potential to be cost-effective in a few areas. Consumer-level food waste occurs most commonly as a result of improper handling, excessive trimming, and inappropriate storage.¹⁶⁹ Confusion over “best by” and “use by” date labeling also significantly contributes to food wasted by individual consumers.¹⁷⁰

Figure 2: Social Marginal Costs and Benefits of Reducing Food Waste in Individual Homes



The graph in Figure 2 above illustrates the likely costs and benefits of reducing food waste in individual households. As shown, the optimal proportion of food waste saved—represented by Q_i^* in the figure—is likely to be low in

169. See generally Buzby & Hyman, *supra* note 16, at 563.

170. See *id.*

comparison to proportions at some other stages of the food supply chain. The marginal benefits of reducing the most valuable and highly reusable household food waste, which is suitable for feeding individuals, animals, or even composting, are relatively high. However, as additional food waste is saved, the benefits of doing so quickly diminish. For example, the benefits of saving small scraps of dinner table food waste, such as produce trimmings or potato skins, are relatively small. This small value is due in part to the fact that much of this waste is not suitable for feeding the hungry and is so varied that it would be relatively expensive to convert it into other usable products.¹⁷¹ Meanwhile, the marginal costs associated with reducing household food waste also increase rapidly as more and more food is saved. For instance, governments could potentially implement consumer education programs, and noncompulsory policy approaches such as the standardization of food date label requirements at a fairly low cost per pound of food saved. However, the per-unit costs of saving food through governmental enforcement of strict household food recovery mandates would likely be very high.

One example of a well-intended but questionable food waste reduction policy is Vermont's statutory ban on food scraps in landfills.¹⁷² The ban, discussed *infra*,¹⁷³ requires the state government to purchase or retrofit garbage trucks or contract with private companies to pick up food waste from individual households throughout the state and take the waste to composting facilities.¹⁷⁴ While the state was contemplating this ban, some industry leaders expressed concern that the state did not have sufficient space in composting facilities to accommodate the food waste.¹⁷⁵ Other jurisdictions that have implemented waste bans rely on private markets to provide adequate food waste processing facilities. Although requiring composting for all household food waste may be feasible in a few areas where populations are relatively small and sufficient composting facilities already exist, it is far less practicable in other areas with greater population densities. Moreover, private citizens in many states and cities are likely to resist governmental enforcement of household food waste recovery requirements based on privacy concerns. In fact, residents of Seattle recently sued the city, arguing that a city ordinance requiring them to separate food waste violates their privacy by directing city officials to inspect their trash.¹⁷⁶

In contrast, federal standardized date labeling requirements and programs aimed at educating consumers about date labels would be relatively inexpensive to enforce and would mitigate the problem of consumers disposing of safe food based

171. See generally Helman, *supra* note 158 (discussing value in salvaged waste).

172. VT. STAT. ANN. tit. 10, § 6605k (West 2012).

173. See notes 111–14 and accompanying text.

174. See Kathryn Flagg, *Mandatory Composting: Coming Soon to a Trash Can Near You*, SEVEN DAYS (Apr. 30, 2014), <http://www.sevendaysvt.com/vermont/mandatory-composting-coming-soon-to-a-trash-can-near-you/Content?oid=2359984>.

175. *Id.*

176. See First Amended Complaint for Violation of Right to Privacy (Wash. Const. Art. I, 7), Due Process (Wash. Const. Art. I, 3), and for Declaratory and Injunctive Relief ¶ 73, *Bonesteel v. City of Seattle*, No. 15-2-17107-1 SEA (Wash. Super. Ct. Apr. 27, 2016),

2016 WL 4041237 (contending that the plaintiffs had “a reasonable expectation that the contents of their garbage cans will remain private and free from government inspection, absent a warrant”).

on misinterpretations of date labels.¹⁷⁷ Consumer food waste education programs, which could be funded through grants, are another potentially cost-effective way of better informing consumers about date labeling, safe storage, and composting.¹⁷⁸ Education programs that inform consumers about the social costs of food waste could also eventually reduce consumer demand for large portion sizes and various types of volume packaging that contribute to consumer-level food waste problems. Meanwhile, grants and tax benefit programs for food waste recovery research might incentivize greater investment in the advancement of food waste reduction and reuse technologies. Among other things, such programs could incentivize the development of coating or packaging technologies capable of further extending food product shelf lives.¹⁷⁹

Globally, several countries are already investing in programs aimed at changing how their citizens think about food waste. Some of these policy efforts, such as one recently implemented in the United Kingdom, attempt specifically to reduce consumer-level food waste.¹⁸⁰ The United Kingdom's campaign included public education efforts as well as data collection on food waste trends.¹⁸¹ The campaign persuaded 1,800 households to record exactly what food they bought and how much of it ended up in the trash and it also collected data from municipal waste collectors.¹⁸² By some accounts, the campaign appears to have been quite successful. Between 2007 and 2012, avoidable food waste—defined as discarded food that could have been eaten, as opposed to unavoidable food waste, like apple cores—per household within the country fell by twenty-four percent.¹⁸³ A similar educational initiative in the United States might be one cost-effective means of changing consumer behavior and thereby reducing food waste at the household level.

B. Reducing Retail and Restaurant Waste

Focusing policy efforts on reducing food waste at the retail and restaurant level of the food supply chain is a somewhat more promising strategy than focusing at the household level, but it still faces some significant challenges. Food waste at the retail and restaurant level is most commonly attributable to causes including dented or damaged packaging, inaccurate estimates of retail demand, and outgrading foods based on appearance.¹⁸⁴ Some stores and restaurants make an affirmative choice to waste food rather than use, donate, or compost it. This may be especially true if an enterprise's business model is based on providing attractive

177. Both government agencies and independent FPCs can undertake education programs to inform consumers about reducing waste, composting, date labeling, donating food, and uses for unattractive foods. ESSEX ET AL., *supra* note 139.

178. See ECKHOUSE, *supra* note 33.

179. *Id.*

180. See Dan Charles, *In the Fight Against Food Waste, Brits Find a Worthy Battlefield: The Home*, NPR (Oct. 15, 2016), <http://www.npr.org/sections/thesalt/2016/10/15/497854941/in-fight-against-food-waste-brits-find-a-worthy-battlefield-the-home>.

181. *See id.*

182. *Id.*

183. *Id.*

184. See Buzby & Hyman, *supra* note 16, at 563.

foods or if donating waste requires time and transportation expenses that the business is unwilling to bear. For example, a supermarket owner surveyed in a University of Pennsylvania study reported that he did not donate more leftover food because he did not have the space to store it until it could be picked up.¹⁸⁵ Similarly, supermarkets may be reluctant to encourage “freegans” or dumpster divers to lurk around their stores waiting for free excess food.¹⁸⁶

Unfortunately, the costs of enforcing food waste regulations are still relatively high at this stage of the food supply chain because of the relatively large number of food waste producers involved per pound of food waste they generate and the varied and relatively low-value nature of that waste. For example, not only would a food waste recovery requirement at this level be expensive to enforce, the recovered food, such as leftover meals and some damaged food products, may not be suitable for human consumption. On the other hand, retailers and restaurants are already accustomed to substantial government regulation so new food waste restrictions on them would not disrupt their existing privacy expectations or freedoms nearly as much as they would for household consumers.

Among other things, market-based programs implemented at the state or local level could potentially be a cost-effective means of incentivizing more restaurants and retailers to reduce food waste. For instance, policies that subsidize or otherwise assist food banks’ efforts to pick up and use food waste from restaurants and retailers could keep large quantities of food from reaching landfills. Several not-for-profit businesses with a local focus, such as DC Kitchen and LA Kitchen, already do much to prevent restaurant and retailer food waste through such activities. Through partnerships with farmers, distributors, and retailers, these businesses acquire donations of food “destined for the landfill” and turn it into meals for low-income clients by partnering with farmers, distributors, and retailers to secure donations.¹⁸⁷ Educating retailers and restaurants about the protections afforded by the GSA and strengthening the tax benefits associated with food donations would incentivize further growth for programs like DC Kitchen and LA Kitchen. Grants or tax benefits for food policy councils and private organizations could similarly incentivize these groups to expand the transportation systems and network platforms needed to connect waste producers with non-profit entities seeking donations of food that would otherwise go to waste.

Several retailers and businesses have already demonstrated that simple internal policy changes can do much to reduce food waste. A relatively new Walmart initiative is an example of such a change. Under the initiative, when a Walmart employee identifies a cracked egg in a carton, he is required to replace the cracked egg with another egg instead of throwing away the entire carton.¹⁸⁸ Market-based initiatives and new tax policies could likewise encourage more retailers to reduce food waste by joining the “ugly foods” movement. Retailers could recover foods that are considered unattractive or under or oversized and offer

185. Finn, *supra* note 48, at 1.

186. See William Kidelsky, *The Freegan’s Creed: Waste Not, Want Not*, GUARDIAN (July 18, 2009, 19:05 EDT), <https://www.theguardian.com/environment/2009/jul/19/freegan-environment-food>.

187. Vogliano & Brown, *supra* note 2, at 1204.

188. *Walmart Tackles Food Waste*, PROGRESSIVE GROCER (July 18, 2016), <http://www.progressivegrocer.com/industry-news-trends/national-supermarket-chains/walmart-tackles-food-waste>.

them to consumers at a discount. Retail chains Whole Foods and Walmart have recently announced initiatives to stock ugly produce.¹⁸⁹ Similarly, *Bon Appetit*, a food service management company, has started a program, “Imperfectly Delicious Produce,” which prevents “edible . . . but cosmetically imperfect produce from going to waste . . . by working with farmers to identify produce that can be rescued, working with distributors to set up the systems for purchasing and transporting the produce, and [working] with chefs to find creative ways to incorporate the produce into menus.”¹⁹⁰ Consumer education programs that inspire more consumers to relax their aesthetic standards for fruits and vegetables could similarly help to further drive demand for edible but imperfect foods and thereby reduce disposal rates for these foods at the retail level.¹⁹¹

Moreover, policies exempting aesthetically imperfect foods from state and local sales tax could encourage consumers to purchase food that would otherwise be outgraded. States often use taxes and tax exemptions to influence consumer behavior.¹⁹² Several states have created specialized taxes to address externality problems by imposing taxes on sodas, junk food,¹⁹³ alcohol, tobacco, and gambling.¹⁹⁴ Conversely, other states have exempted nonprescription drugs, proprietary medicines,¹⁹⁵ energy efficient appliances,¹⁹⁶ and biodiesel fuel¹⁹⁷ from sales tax in an effort to encourage purchases of those products¹⁹⁸ or to remove

189. See Maria Godoy, *Wal-Mart, America's Largest Grocer, Is Now Selling Ugly Fruit and Vegetables*, NPR (July 20, 2016), <http://www.npr.org/sections/thesalt/2016/07/20/486664266/walmart-world-s-largest-grocer-is-now-selling-ugly-fruit-and-veg> (stating that Walmart plans to sell weather-dented apples at a discount in Florida stores); see also Allison Aubrey, *From Ugly to Hip: Misfit Fruits and Veggies Coming to Whole Foods*, NPR (Mar. 7, 2016), <http://www.npr.org/sections/thesalt/2016/03/07/469530045/from-ugly-to-hip-misfit-fruits-and-veggies-coming-to-whole-foods> (stating Whole Foods will sell “funky” fruits and vegetables at stores in Northern California).

190. Vogliano & Brown, *supra* note 2, at 1203.

191. Elizabeth Royle, *How 'Ugly' Fruits and Vegetables Can Help Solve World Hunger*, NAT'L GEOGRAPHIC (Mar. 2016), <http://www.nationalgeographic.com/magazine/2016/03/global-food-waste-statistics/>.

192. See generally Ryan Bubb & Richard H. Pildes, *How Behavioral Economics Trims Its Sails and Why*, 127 HARV. L. REV. 1593, 1602 (discussing the use of taxes as a policy solution to influence consumer behavior).

193. See generally Katherine Pratt, *A Constructive Critique of Public Health Arguments for Antiobesity Soda Taxes & Food Taxes*, 87 TUL. L. REV. 73 (2012).

194. Andrew J. Haile, *Sin Taxes: When the State Becomes the Sinner*, 82 TEMP. L. REV. 1041, 1042 (2009) (discussing state use of sin taxes to discourage certain “socially disfavored behaviors”).

195. See, e.g., Julie Gathers, Note, *Beyond Balancing the Budget: Tax Reform to Increase Equity and Reduce Poverty in the Commonwealth of Virginia*, 14 GEO. J. ON POVERTY L. & POL'Y 393, 399 (2007) (mentioning Virginia's exemption).

196. See, e.g., U.S. Dep't of Energy, *Sales Tax Holiday for Energy Efficient Appliances*, ENERGY.GOV (last visited Feb. 25, 2017), <https://energy.gov/savings/sales-tax-holiday-energy-efficient-appliances> (“The state of Missouri offers consumers a seven-day exemption from state sales taxes on certain ENERGY STAR certified new appliances.”).

197. Jenny Wilkes Robertson, *Tax Law*, 30 U. ARK. LITTLE ROCK L. REV. 735, 735 (2008).

198. See generally Erik Smith, *The Whole Home Approach: Spurring Home Energy Efficiency Through a Renewable and Transferrable Property Tax Incentive*, 6 ARIZ. J. ENVTL. L. & POL'Y 398, 401 (2015) (discussing the use of sales tax exemptions to incentivize investment in home energy investment).

affordability barriers.¹⁹⁹ State or local tax policies that exempt ugly foods and foods close to their label date from sales tax could both encourage purchases of food that would otherwise be outgraded and improve access to healthy foods for low-income individuals. Of course, such an exemption would only make sense in states and localities that do not already exempt food from sales tax.²⁰⁰

In addition to promoting bottom-up strategies for addressing retail and restaurant food waste, European policymakers have successfully implemented legislative requirements that could feasibly combat the same problem in the United States. France, Italy, and the United Kingdom have all implemented new regulatory restrictions aimed at reducing food waste at the retail and restaurant level. For example, laws in France bar supermarkets from deliberately allowing unsold food to spoil.²⁰¹ Larger French supermarkets are required to sign contracts with charities to donate unsold food, and non-cooperating stores are subject to large fines or up to two years in jail.²⁰²

Other European countries have adopted carefully tailored bottom-up and market-based strategies as means of reducing food waste at the retail and restaurant stage of the food supply chain. For instance, Italy's legislature enacted a bill in 2016 aimed at cutting one million tons from the estimated five million tons of food the country wastes each year.²⁰³ Among other things, this new law seeks to make it easier for businesses to donate food by allowing them to record their food donations on a single form every month.²⁰⁴ The statute also protects Italian businesses from penalties for donating food past its sell-by date, allows businesses to pay less tax commensurate with the more food they donate, and enables Italian farmers to give unsold produce to charities without incurring any costs.²⁰⁵ In accordance with the law, Italy's Agricultural Ministry will spend approximately one million euros researching new ways to package foods to prevent spoilage in transit and extend shelf life, and it has plans to roll out a public information campaign aimed at reducing food waste. The country is even promoting a change to traditional dining practices by encouraging restaurants to provide "family bags" for diners to take home leftovers.²⁰⁶ The United States could follow suit to empower businesses and consumers to take action to reduce their own food waste.

The United Kingdom has likewise initiated its own nationwide campaign to cut food waste by encouraging food manufacturers to reduce portion sizes of pre-packaged meals and create packaging that allows for easier storage of leftover

199. Gathers, *supra* note 197, at 399 (noting that a sales tax exemption for certain necessities can be used to remove barriers to purchase for low-income individuals).

200. See generally FED'N. OF TAX ADMIN., STATE SALES TAX RATES & FOOD & DRUG EXEMPTIONS (last updated Jan. 1, 2018), <http://www.taxadmin.org/assets/docs/Research/Rates/sales.pdf> (detailing states that exempt food, prescription drugs, and nonprescription drugs from state sales tax and those that subject the previously listed products to a reduced or general sales tax rate).

201. Angelique Chrisafis, *supra* note 19.

202. See *id.*

203. *Italy Adopts New Law to Slash Food Waste*, BBC NEWS (Aug. 3, 2016), <http://www.bbc.com/news/world-europe-36965671>.

204. *Id.*

205. *Id.*

206. *Id.*

food.²⁰⁷ The goal of this United Kingdom initiative mirrors the EPA and USDA's food waste challenge discussed above, but the United Kingdom initiative goes a step further by providing clear guidance and examples of what retailers can do to reduce food waste.

To the extent governmental policies are cost-justifiable to reduce food waste at the retail and restaurant level, policymakers in the United States should look to the success of foreign policies designed to combat food waste in retail and restaurants. Direct engagement with retailers and restaurants, clear guidance, enforcement mechanisms, and resources needed to make changes are hallmarks of Italy, France, and the United Kingdom's efforts. Policies that share these characteristics could help to reduce food waste in the United States. However, the relative costs and benefits of governmental policies should be carefully considered in light of the large number of waste producers and the type of waste that could be recovered. Market-based strategies similarly present considerable opportunities to encourage retailers and restaurants to reduce food waste.

C. Reducing Food Waste at Public Schools and Universities

The net social benefits of food waste reduction policies are generally stronger for public education institutions than for restaurants, retailers, or households. The larger quantities and greater value of potentially recoverable excess food in these settings and relatively low enforcement costs associated with them make public schools a comparatively appealing target for policymakers searching for ways to increase food waste recovery.

School and university cafeterias and meal programs account for a substantial amount of the food waste in the United States. For example, in Los Angeles Unified School District, the nation's second largest school system, students throw out at least \$100,000 worth of food in school cafeterias on a daily basis. This amounts to \$18 million per year based on a conservative estimate that just ten percent of food that is served is wasted.²⁰⁸ Comparable quantities of waste also occur at college and university campuses, where millions of pounds of food are wasted each year.²⁰⁹

Regulating food waste at government-affiliated schools and other institutions is potentially less costly than regulating private restaurants and businesses, in part because meal programs at schools and universities receive significant funding from federal and state governments and are already accustomed to heavy regulation.²¹⁰ For instance, governments could make at least some portion of their funding for school meal programs contingent on the adoption of waste-

207. Charles, *supra* note 182.

208. Teresa Watanabe, *Solutions Sought to Reduce Food Waste at Schools*, L.A. TIMES (Apr. 1, 2014), <http://www.latimes.com/local/la-me-laUSD-waste-20140402-story.html>.

209. Quinn Sanderson, *Universities Leading the Charge on Food Waste*, FOODTANK (last visited Feb. 27, 2018), <http://foodtank.com/news/2015/10/universities-leading-the-charge-on-food-waste/>; see also Vogliano & Brown, *supra* note 2, at 1204 (discussing the waste-reduction benefits of "going trayless" in school and university dining halls).

210. *National School Lunch Program*, U.S. DEP'T AGRIC. FOOD & NUTRITION SERV. (Sept. 2013), <https://www.fns.usda.gov/nslp/national-school-lunch-program-nslp>.

conscious food service practices and could require schools and other government-affiliated institutions to take steps to reduce, reuse, or compost waste.

In recent years, large institutions have used new technologies to reduce food waste in large-format dining halls and cafeterias throughout the country. LeanPath software, which the University of California Berkeley's dining services have used for years, identifies contributors to food waste including the timing and duration of meal periods, the number of serving lines, and the availability of grab-and-go options. Use of this software at UC-Berkeley has already resulted in a forty-three percent reduction in food waste, saving more than 1,000 pounds of food and \$1,600 per week.²¹¹ Similar software could someday also issue updated guidance and technical assistance to reduce food waste at other institutions.

Meaningful reductions in food waste created within school meal programs are also possible through the adoption of various low-cost best practices in that setting. One study found that when college dining halls go trayless for a day, food waste is decreased by twenty-five to thirty percent per person.²¹² Researchers believe that this is because eliminating trays "requires patrons to make choices more carefully" and thereby reduces the amount of food that diners take.²¹³ Allowing students to keep a lunch or breakfast item to eat later in the day may also reduce the amount of food that students waste at mealtimes, as can setting up locations for students to place items they have taken but later elected not to consume so those items can be consumed by other students or donated. Students can even compost food waste for school gardens or collaborate with local farmers on composting or food scrap projects.²¹⁴

Providing training and support to food service personnel in large institutional dining environments on these and other food recovery strategies could do much to reducing in-kitchen food loss, improving the acceptability of foods served, and even increase donations of leftovers where feasible.²¹⁵ Similar policy strategies may be applicable in prisons, military installations, and businesses with federal contracts that have large institutional food service systems.

D. Reducing Production-Level Food Waste

New policies have the greatest likelihood of cost-effectively reducing food waste in the production level stage of the food supply chain, which includes commercial farm operations and food processing plants. Food waste on farms most commonly results from consumption or damage by insects, birds, and microbes; spillage and damage due to equipment or cool storage malfunction; and overplanting and failure to harvest entire yields due to diminishing returns or additional costs of harvesting. Agricultural level food waste also results from compliance with industry or government food safety regulations, failure to divert

211. GUNDERS, *supra* note 20, at 12.

212. Sanderson, *supra* note 211.

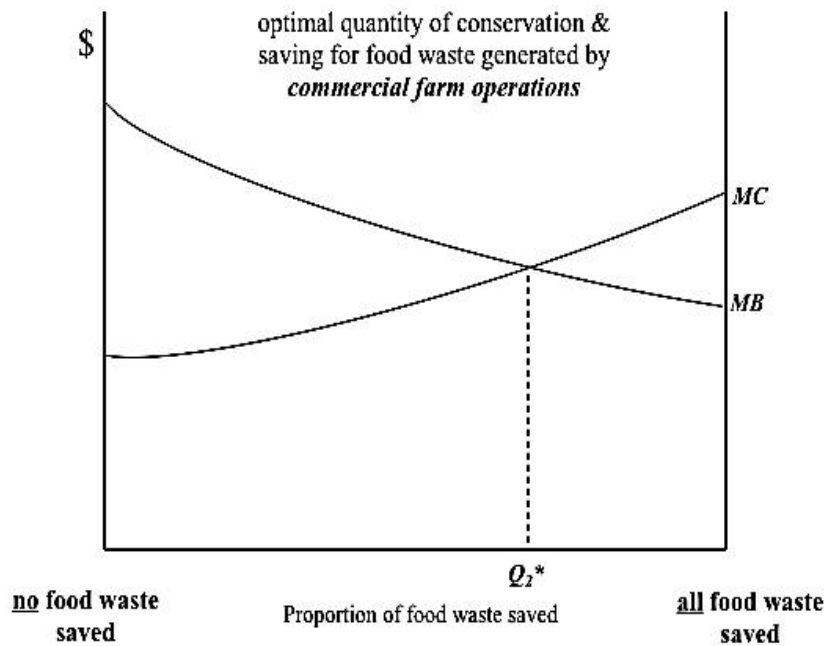
213. Vogliano & Brown, *supra* note 2, at 1204.

214. See U.S. DEP'T OF AGRIC., REDUCING FOOD WASTE: WHAT SCHOOLS CAN DO TODAY, <https://fns-prod.azureedge.net/sites/default/files/cnd/Infographic-food-waste.pdf> (last visited Feb. 27, 2018).

215. ECKHOUSE, *supra* note 33.

byproducts from food processing to secondary uses; and outgrading of produce due to aesthetic standards.²¹⁶ Efforts to reduce waste at this level can do much to conserve water, energy, and other scarce natural resources associated with food production.²¹⁷ These efforts will become increasingly important over the coming decades as the nations of the world strive to feed a growing global population.²¹⁸

Figure 3: Social Marginal Costs and Benefits of Reducing Production-Level Food Waste



As Figure 3 above suggests, the potential net benefits of reducing large quantities of food waste at the production stage of the food supply chain are particularly substantial. The quantity and value of potentially salvageable food at this level is likely to be enormous in comparison to the household or retail stage. The types of food wasted at this level, often whole foods, can be more easily repurposed for high-value uses.²¹⁹ For example, farmers who divert excess or aesthetically imperfect crops for secondary uses may be able to profit from selling those crops for juicing, freezing, canning, or other secondary uses. Similarly,

216. Buzby & Hyman, *supra* note 16, at 563.

217. See Nink, *supra* note 18.

218. See Buzby & Hyman, *supra* note 16, at 562.

219. The highest value use of food waste is feeding hungry people, followed by feeding animals, industrial uses, and composting. See *Food Recovery Hierarchy*, *supra* note 42. Landfill disposal should be the last resort. See *id.*

diverting crops—that would otherwise be wasted—for donation to food banks or gleaning organizations creates considerable social benefits by feeding hungry people and reducing overall waste.

Moreover, the likely costs per pound of enforcing laws aimed at salvaging more of this food are relatively low. The number of producers to be regulated is relatively small, and many of these producers are already subject to various regulations so adding food waste-related rules would be less likely to disrupt their business operations or interfere with their privacy rights. As described in Section II.B.1²²⁰ a significant proportion of the nation’s food producers actually receive heavy federal subsidies already, seemingly making it less controversial to impose new food conservation and waste recovery requirements upon them. For instance, new laws could require qualification for certain federal agricultural benefits to be dependent upon implementation of a specific set of waste reduction best practices. To assist farmers in complying, governments could implement programs designed to give farmers more convenient access to potential buyers of wholesome food or alternative uses for food waste. In summary, the enforcement costs of food waste regulations at this level are relatively low and the marginal benefits of reducing food waste are relatively high, suggesting that various types of additional food waste regulation could be justifiable at this stage of the food supply cycle. This is represented by the location of Q_2^* on the graph in Figure 3—a location that is much further to the right than that of Q_1^* on Figure 2.

One major contributor to food waste at the production level is the overproduction and overplanting of crops in response to government benefit programs. As discussed above, crop insurance and other federal benefits provided under the Farm Bill incentivize farmers to grow excessive quantities of crops.²²¹ When market prices for their crops decline or crops suffer damage and thus qualify for federal assistance, farmers have very little incentive to expend funds to harvest surplus or transport them into markets for sale. Reforming Farm Bill benefits that incentivize overplanting could thus be a valuable means of reducing food waste.

Although the social benefits of reforming the Farm Bill could be significant, substantial obstacles stand in the way of such reform. Incumbent Farm Bill beneficiaries, especially farmers who rely on crop insurance and other federal subsidies, advocate in earnest for Congress to maintain and not alter existing benefit programs.²²² In fact, “big agriculture” and agrochemical trade associations spent more than \$126 million in campaign contributions and lobbying expenditures in 2016.²²³ The agricultural lobby is a notoriously powerful group with great influence over agricultural policy in the United States. In the past, some very modest proposals for changes to the Farm Bill triggered significant political resistance, and larger reform efforts stirred vigorous conflicts.²²⁴ For example,

220. See *supra* notes 68–76 and accompanying text.

221. See *generally supra* notes 65–78 and accompanying text.

222. See Charles, *supra* note 85.

223. *Agribusiness*, OPEN SECRETS: CTR. FOR RESPONSIVE POL. (Jan. 25, 2017) <https://www.opensecrets.org/lobby/indus.php?id=A>.

224. See Marion Nestle, *The Farm Bill Drove Me Insane*, POLITICO (Mar. 17, 2016, 4:55 AM EDT), <http://www.politico.com/agenda/story/2016/03/farm-bill-congress-usda-food-policy-000070#ixzz43AZz4OmM>. “The only hope I see for meaningful change is grass-roots advocacy—a

contentious and reliably partisan negotiations over portions of the 2014 Farm Bill such as the Supplemental Nutrition Assistance Program (SNAP) and the crop insurance program delayed the Bill's passage for an entire year.²²⁵ Any proposed reforms to the Farm Bill aimed at curbing waste among food producers would have to somehow overcome these steep political hurdles to find any success on Capitol Hill.

Uncertain markets for food products generated at the production level are another contributor to food waste. Any rational farmer who overplants due to an error in predicting demand and is unable to sell crops for a price that covers her costs of harvesting them is likely to let the crop go to waste.²²⁶ Fortunately, gleaning programs can help to provide labor to harvest low-value crops in these situations.²²⁷ Under gleaning programs, volunteers harvest a crop and then donate it to charities or keep it for themselves. Food policy councils and food banks often provide volunteer labor to glean fields under such arrangements.²²⁸ The challenge that many gleaning organizations face, however, is getting gleaners to the farm before the crop rots in the field.²²⁹ Policies that incentivize the development of information systems and networks for coordinating gleaning efforts would be one means of helping to reduce this problem by enabling farms to more timely notify gleaning groups of rescue opportunities. Tax benefits are already available to farmers who allow gleaners to harvest their crops,²³⁰ but increasing those benefits could help to drive growth in gleaning activities as well.

Another source of waste created at this level involves the by-products of food processing.²³¹ In many food-processing facilities, by-products are created

uniting of the many groups working on farm bill issues to create one loud voice for improving the bill, program by individual program." *Id.*

225. See generally, e.g., Jonathan Weisman & Ron Nixon, *House Republicans Push Through Farm Bill, Without Food Stamps*, N.Y. TIMES (July 11, 2013), <http://www.nytimes.com/2013/07/12/us/politics/house-bill-would-split-farm-and-food-stamp-programs.html>. The 2014 Farm Bill negotiations were so contentious that "Michigan Sen[ator] Debbie Stabenow, the top Democrat on the Senate Agriculture Committee, told a meeting of the organic industry several months after the 2014 farm bill was signed: 'I don't want to think too much about [the next farm bill], otherwise I might slit my throat.'" Ian Kullgren, *Too Soon To Talk About the 2018 Farm Bill?*, POLITICO (Apr. 14, 2016, 10:00 AM EDT), <http://www.politico.com/tipsheets/morning-agriculture/2016/04/too-soon-to-talk-about-the-2018-farm-bill-salt-fights-back-ag-appropriators-back-213-billion-bill-213764>.

226. Tina Mather et al., *Food to Waste*, HUNGER GOLDEN ST. (Apr. 5, 2010, 6:34 PM), [<http://hungerinca.uscannenberg.org/index/index-10.html?p=112>].

227. *Id.*

228. See, e.g., ALETHEA HARPER ET AL., INST. FOR FOOD & DEV. POLICY, *FOOD POLICY COUNCILS: LESSONS LEARNED*, 21, 42 (2009), <https://foodfirst.org/wp-content/uploads/2014/01/DR21-Food-Policy-Councils-Lessons-Learned-.pdf> (listing gleaning as an activity of many FPCs); U.S. DEP'T OF AGRIC., *LET'S GLEAN!: UNITED WE SERVE TOOLKIT*, (2010), https://www.usda.gov/documents/usda_gleaning_toolkit.pdf; *Gleaning Volunteers*, SECOND HARVEST FOOD BANK, <http://no-hunger.org/gleaning-volunteers/> (last visited Feb. 23, 2017).

229. See GUNDERS, *supra* note 20, at 17.

230. See, e.g., GILBERTO SORIA MENDOZA, NAT'L CONFERENCE OF STATE LEGISLATURES, *FEEDING PEOPLE, NOT LANDFILLS: WHY REDUCING FOOD WASTE MATTERS* (2013), <http://www.ncsl.org/documents/statefed/humserv/FoodWasteBriefAug2013.pdf>.

231. MINN. TECH. ASSISTANCE PROGRAM, UNIV. OF MINN., *COMPOSTING AND LAND SPREADING FOOD PROCESSING BY-PRODUCTS* (2010), <http://mntap.umn.edu/food/resources/78FS.CompostLandSpread.pdf>.

alongside the food being processed. These by-products may include fruit and vegetable waste, pits, seeds, meat and dairy products, fats, and grease.²³² Often, producers choose to discard this waste, even though they may incur disposal costs as a result.²³³ However, many by-products of food processing can be recovered and put to alternate, revenue-generating uses.²³⁴ For example, almond hulls, apple pulps, and grape pomace can all be used as nutrient sources in livestock feeds.²³⁵ Similarly, producers can sell apricot pits for use in fireplace logs,²³⁶ and other byproducts can be used as biofuel.²³⁷ Food processing also represents an opportunity to reduce the overall amount of natural resources embedded in food production: water and energy used and generated in food processing operations can be recycled and put to use in the continued operation of the processing facility.²³⁸

Food producers often waste food post-harvest because they lack cold storage capacity and transportation systems to connect surplus produce and other food products with end users.²³⁹ Governments can thus help to reduce waste at this level through programs that more seamlessly connect surplus food with people in need. Policies that promote the development of improved information systems and other technologies would be one means of encouraging infrastructural and other investments capable of enabling food producers to more easily find users for surplus food that they cannot afford to store or transport.²⁴⁰

Food Cowboy is an example of a recently developed mobile technology platform that helps growers, transporters, and wholesalers “to find buyers for refused food deliveries or to route them to charities (composting facilities, or markets for compost).”²⁴¹ The platform also allows retailers to notify transporters in the area about a donation ready for pickup.²⁴² Promoting the expansion of

232. *Id.*

233. K. Jayathilakan et al., *Utilization of Byproducts and Waste Materials From Meat, Poultry and Fish Processing Industries: A Review*, 49 J. FOOD SCI. & TECH. 278, 279 (2011).

234. *Id.*

235. *Agricultural, Forest & Urban, Green By-Product Marketing and Recycling*, AGRA MARKETING GROUP, <http://agramarketing.com/> (last visited Feb. 25, 2017).

236. *See Fruits*, AGRA MARKETING GROUP, <http://agramarketing.com/page/stone-fruits.html> (last visited Feb. 25, 2017).

237. *See* Jayathilakan et al., *supra* note 235, at 290 (discussing use of agricultural by-products for biofuel); *Agricultural, Forest & Urban, Green By-Product Marketing and Recycling*, *supra* note 237 (same).

238. *See, e.g.*, L.J. Xu et al., *Recovery and Utilization of Useful By-Products from Egg Processing Waste Water by Electrocoagulation*, 81 POULTRY SCI. 785, 785 (discussing recycling of waste water from egg production); *Industrial Uses for Wasted Food*, U.S. ENVTL. PROTECTION AGENCY, <https://www.epa.gov/sustainable-management-food/industrial-uses-wasted-food#purdue> (last visited Feb. 25, 2017) (listing industrial uses of byproducts from food processing); Chris Simmons, *Enhancing Resource Efficiency and Sustainability in Food Processing: Food Processing Waste Stream Utilization*, FOOD SCI. & TECH. ENERGY EFFICIENCY CENTER U. CALIF. DAVIS, http://worldfoodcenter.ucdavis.edu/docs/simmons_chris.pdf (last visited Feb. 25, 2017).

239. *See* FOOD COWBOY, *supra* note 18, at 3 (“Today, food banks lack the information systems, cold storage capacity, transportation, and disposal capabilities necessary to accept all the food that could be donated to them.”).

240. *See, e.g., id.* at 5–7.

241. *Id.* at 5.

242. *Id.* at 6.

platforms like Food Cowboy and the creation of other food recovery networks is a promising strategy for reducing food waste because the use of such platforms often pays off for participants under the nation's existing food policy structure. For example, the Internal Revenue Code permits food companies to deduct half of their foregone profits in addition to costs when they donate surplus inventory instead of throwing it away.²⁴³ Of course, offering tax credits rather than deductions would even further encourage producers to donate food if such a change were politically feasible. Certain donors in California, Colorado, Iowa, Kentucky, Michigan, Missouri, and Oregon already qualify for state tax credits for making comparable food donations in those states.²⁴⁴

Theoretically, policymakers could consider imposing a tax on producers who fail to recover extra food and opt to dispose of it instead. Because waste produced at the agricultural level generates relatively low private costs,²⁴⁵ a tax on disposal of food at this level may be appropriate.²⁴⁶ Practically, however, a tax on food disposal would be difficult to implement, as assessment of a tax on wasted food would likely require farmers to report how much they dispose of, implicating high enforcement and administrative costs. A tax incentive is likely a more cost-justifiable means to influence waste-conscious behavior at this level. While the enforcement cost of administering a tax on agricultural waste producers is likely to be very high, the enforcement cost associated with managing an incentive program is minimal. Moreover, as discussed above, the value of food recovered at this level, and the opportunity to divert it to high-value uses, justifies the loss in tax revenue that, but for the incentive, would be collected as government revenue.²⁴⁷

One other potentially promising means of reducing food waste at the agricultural stage of the food supply chain is to promote the expansion of secondary markets and uses for outgraded crops. The potential social benefits of facilitating the expansion of these markets are substantial. Secondary markets for frozen or canned foods and juices already provide opportunities for farmers to generate income from outgraded farm produce that might otherwise have gone to waste at the farm. Tree Top, a major apple producer in Washington, uses its imperfect apples to make apple juice, applesauce, and apple bits for oatmeal.²⁴⁸ This single company's practices make valuable use of nearly 600 million pounds of "ugly" apples each year that would otherwise be wasted. Tree Top's willingness to purchase these outgraded apples clearly benefits the company's cooperative growers by enabling them to earn revenue for fruit they otherwise would not be

243. I.R.C. § 170(e)(3)(B) (2015).

244. FOOD COWBOY, *supra* note 18, at 4.

245. *See supra* Figure 3.

246. *See* Helmuth Cremer et al., *Externalities and Optimal Taxation*, 70 J. PUB. ECON. 343, 344 (1998) (This type of tax, often called a Pigouvian tax after economist A.C. Pigou, is levied on an externality-generating activity in an amount equal to the activity's marginal social cost.); *see also* PAUL A. SAMUELSON, *ECONOMICS* 477 n.10 (10th ed., 1976) (Pigou argued that there is a "clear-cut economic case" for a tax when there is a divergence between private costs and marginal social costs).

247. *See generally* Joseph Lennihan, *What Is the Value of Estimating the Value of Tax Incentives?*, J. MULTISTATE TAX'N & INCENTIVES (Aug. 2015).

248. Jordan Figueiredo, *Saving 600 Million Pounds of Ugly Apples*, FOODTANK (last visited Feb. 18, 2018), <http://foodtank.com/news/2016/10/saving-600-million-pounds-of-ugly-apples>.

able to sell.²⁴⁹ Programs designed to encourage more private businesses to make analogous uses of outgraded farm products could greatly reduce food waste on farms throughout the country.

CONCLUSION

Like the lettuce farmers in the Salinas Valley, millions of farmers, retailers, restaurateurs, and ordinary consumers across the United States continue to waste staggering amounts of food each day. Fortunately, there are abundant opportunities for policymakers to address this problem through laws thoughtfully tailored to promote efficient levels of food conservation and waste recovery at each stage of the nation's food supply chain. This article offers a basic cost-benefit framework, premised on economic principles and theoretical assumptions, policymakers could use to craft policies to more efficiently and effectively promote less food waste at different stages of the food supply chain.

The optimum quantity of food waste reduction in any given context is a function of both the private and social costs of implementing reduction efforts and benefits that can be obtained from them. This microeconomic framework considers the costs and benefits of various food waste reduction strategies in various settings that are key to incentivizing optimal food recovery practices on farms, at dinner tables, and at every stage in between.

In citizens' private households, the costs of restrictions on food waste are likely to be high in relation to the value and quantity of food that they might save. However, other policy strategies such as consumer education programs and the standardization of date labeling requirements could potentially be cost-justifiable at the consumer level. Within restaurants and other retail establishments, policies aimed at expanding private markets for recovered food and at strengthening incentives to voluntarily donate excess food are a particularly promising means of encouraging more food waste recovery.

In public school cafeterias and other government-affiliated institutional settings, top-down waste reduction requirements are comparatively more likely to be cost-effective given the lower number of waste producers involved and large quantity of high-value food capable of being recovered. Policies aimed at reducing food waste among farmers and other food producers are likely to be the most cost-justifiable means of addressing the problem. Laws targeting waste at that early stage of the food supply chain could save massive quantities of valuable food, would involve relatively low enforcement costs, and would conserve large amounts of water, energy, and other precious resources.

Although food waste inflicts substantial harm on the environment and on society generally, carefully-tailored policies have the potential to generate meaningful progress toward a more sustainable and less wasteful food system. As policymakers more carefully weigh the relative costs and benefits of proposed food waste policies, they will be better able to identify those laws that are most capable of promoting optimal levels of food waste recovery. Such laws could contribute greatly to ongoing global efforts to fight hunger and would help to better preserve the planet's precious food-related resources for generations to come.

249. *See id.*