

# CHAMPIONS 12.3

## THE BUSINESS CASE FOR REDUCING FOOD LOSS AND WASTE: RESTAURANTS

A Report on Behalf of Champions 12.3

12 RESPONSIBLE CONSUMPTION AND PRODUCTION



### SUMMARY FINDINGS

We analyzed data of preconsumer waste from 114 restaurant sites, located across 12 countries, and calculated the following results:

- The average benefit-cost ratio for food waste reduction was 7:1 over a three-year time frame.
- Within the first year of implementing a food waste-reduction program, 76 percent of the sites recouped their investment. Within two years of implementing a program, 89 percent of their sites recouped their investment.
- By reducing food waste, the average site saved more than 2 cents on every dollar of cost of goods sold (COGS).
- There appears to be no clear correlation between benefit-cost ratios and a site's market segment or geography.
- Key strategies for achieving food waste reduction were to measure the food waste, engage staff, reduce food overproduction, rethink inventory and purchasing practices, and repurpose excess food.

### DIVING INTO A SECTOR

#### Context

According to available estimates, approximately one-third of all food produced in the world intended for human consumption is lost or wasted (FAO 2011). This level of inefficiency in the global food system has significant economic, social, and environmental impacts. It amounts to economic losses of \$940 billion per year (FAO 2015). It means that more than a billion tons of food never get consumed each year, while one in nine people remain undernourished (WFP 2018). In addition, food loss and waste is responsible for an estimated 8 percent of annual greenhouse gas emissions; if it were a country, food loss and waste would be the third largest emitter after China and the United States (CAIT 2018; FAO 2015).

#### ABOUT THIS PUBLICATION

This publication focuses on the financial business case for reducing food loss and waste in restaurants. It is a supplement to *The Business Case for Reducing Food Loss and Waste* and provides additional sector-specific data and analyses. *The Business Case for Reducing Food Loss and Waste* was published in March 2017 and is available at [www.champions123.org/the-business-case-for-reducing-food-loss-and-waste/](http://www.champions123.org/the-business-case-for-reducing-food-loss-and-waste/).

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Reducing food loss and waste can generate a triple win: for the economy, for food security, and for the environment. But why is food loss and waste reduction not already being implemented at sufficient scale? Interviews with private-sector decision-makers indicate that one reason is that many managers may not be aware—or may not believe—that there is a solid business case for reducing food loss and waste. For instance, the associated costs of food loss and waste may be buried in operational budgets, accepted as the cost of doing business, or considered not worth the investment needed to achieve reductions.

According to *The Business Case for Reducing Food Loss and Waste* (Hanson and Mitchell 2017), there is a robust business case for companies to reduce food loss and waste. That publication analyzed historical data from nearly 1,200 business sites across 17 countries and more than 700 companies. These companies represented a range of sectors, including food manufacturing, food retail (for example, grocery stores), hospitality (for example, hotels), and food service (for example, canteens, restaurants). The analysis found that the median benefit-cost ratio was 14:1. Thus, for every \$1 (or other relevant currency) invested in food loss and waste reduction, half of the surveyed company sites realized a \$14 or greater return.

There is also a nonfinancial business case for reducing food loss and waste. Interviews with business leaders indicated that there are a number of strategic yet nonfinancial motivators. These relate to waste regulations, environmental sustainability, food security, stakeholder relationships, brand recognition, and a sense of ethical responsibility. Although these benefits may be hard to quantify in monetary terms, interviewees indicated that these nonfinancial reasons are an important part of the business case for action.

Since the launch of *The Business Case for Reducing Food Loss and Waste*, some private-sector managers have asked the authors what the financial business case looks like for specific sectors. “The 2017 publication gave a good overview across industry sectors, but we want to know what our sector looks like alone,” is a request periodically heard. This publication continues our effort to address this request, focusing on the restaurant sector. A publication focusing on hotels was published in April 2018, and a publication focusing on caterers was published in June 2018.

## Methodology

In this publication, we analyzed new data from restaurant operations with a level of granularity not available to the authors a year ago. In total, we have data about food waste-reduction efforts from 114 restaurant sites across 12 countries. Based on these data, we calculated the benefit-cost ratios, cost reductions, payback periods, and investments made. We then conducted interviews with managers, including managers of the data providers from these restaurant sites, to identify what actions the sites took to reduce their food waste. We have illustrated real world experiences via case studies, although it is not possible to guarantee that case study sites are included in the dataset for reasons of anonymity.

This publication is intended to supplement *The Business Case for Reducing Food Loss and Waste*. We encourage audiences to read that publication as well in order to have a holistic picture of business reasons for tackling this important issue.

## BENEFIT-COST RATIOS

Based on the suite of real-world, historical examples for which we could obtain both financial benefit and cost data, we estimate the benefit-cost ratios of taking action to reduce food loss and waste for restaurants. A benefit-cost ratio is the ratio of financial benefits to financial costs attributable to the food loss and waste actions or program. Box 1 summarizes the methodology and dataset for the benefit-cost ratio analysis in this publication. While the analysis includes all restaurant sites for which data could be accessed, it is not possible to guarantee that these results would be applicable to the entire restaurant sector or to any particular restaurant. What we could access is a small dataset relative to all restaurant operations in the world. Therefore, be cautious when applying our results to other instances.

From the pool of data we could access, 89 percent of the sites analyzed had a net positive financial return, that is, a benefit-cost ratio greater than one-to-one (1:1). The median benefit-cost ratio—where half of the sites achieved a higher ratio while half achieved a lower ratio—was 7:1 (Figure 1). Thus, for every \$1 (or other relevant currency) invested in food waste reduction, half of the sites realized a \$6 return or greater. Expressed in terms of return on investment (ROI), this is a greater than 600 percent return on investment. The average benefit-cost ratio was also 7:1.

## BOX 1. Methodology for Quantifying Benefit-Cost Ratios

The analyses of benefit-cost ratios have the following parameters:

- **Benefits and costs.** Our analyses factor in both the benefits and the costs of reducing food loss and waste. Costs include how much an entity pays to quantify where and how much food is being lost and wasted, identify which actions it will take, and implement those actions. This includes expenditures on consultants, equipment, staff training, and more. The benefits are the financial gains (that is, lower costs, additional revenue) from reducing food loss and waste. This includes optimizing food or raw material purchases (since more of what is purchased is consumed or used in a salable product), lowering waste collection and management costs, adding revenue by selling food that otherwise would have been unsold, and more.

To illustrate how we calculate a benefit-cost ratio, assume the following scenario: A restaurant has baseline annual food sales of \$3 million and food costs of \$900,000. After one year of implementing a food waste-reduction program, annual food sales are still \$3 million, but food costs are reduced by \$27,000. When calculating the benefit-cost ratio for this time frame, the numerator (that is, benefit) would be \$27,000. Suppose the restaurant spent \$5,400 on the food waste-reduction program. This amount is the denominator (that is, cost). The resulting benefit-cost ratio for this restaurant would be 5:1.

- **Individual entities.** The benefit-cost ratios we developed are for individual business sites. We were able to access historical financial cost and benefit data for food waste-reduction efforts of 114 restaurant sites located across 12 countries: Belgium, China, Czech Republic, Denmark, Hungary, Ireland, Italy, Netherlands, Norway, Poland, Sweden, and the United Kingdom. Benefit and cost data in local currencies have been converted to current year U.S. dollars. Except where noted, the sources of the data points are treated anonymously to preserve commercial confidentiality.

- **Historical data.** Our analyses are based on actual field data, not pro forma calculations.

- **Time period.** For each site for which a benefit-cost ratio is calculated, we standardized the data provided to us by calculating the financial costs and the financial benefits cumulated over a three-year period. The three-year period for each site begins at implementation of a food waste-reduction program. Using a three-year time period enables us to capture the fact that for many sites, the majority of the costs occur in the first year and decline thereafter, while the financial savings start in the first year and continue each year thereafter. Usually there is a fixed investment cost occurring in the first year, followed by a smaller amount of annual recurring costs to maintain the program and monitor program implementation. Nonetheless, a three-year

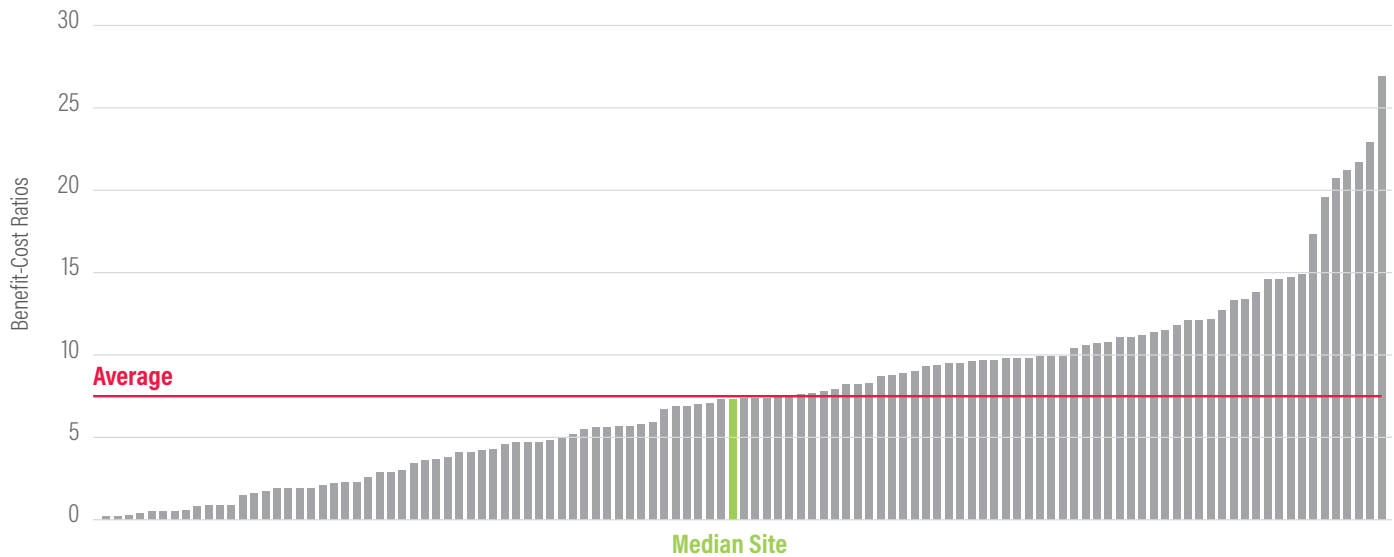
time horizon is conservative to the degree that cost savings continue after year three with continued investment. For sites with less than three years of data, we assumed that the pattern of actual results from the most recent weeks for which data are available would continue. This assumption is based on historical data of benefit and cost cash flow patterns from sites with three or more years of data collection.

- **Discount rate.** The benefit-cost ratio is the ratio of the three-year cumulated discounted flow of financial benefits to the three-year cumulated discounted flow of financial costs. We apply a conservative 10 percent per annum discount rate.<sup>a</sup>

- **Food waste measured.** In this analysis, we assessed food waste generated in a site's kitchen. This includes food and the associated inedible parts remaining from preparation, storage, and any leftovers thrown away by kitchen staff. The analysis includes neither food rescued (for example, given to charity) nor plate waste from customers (that is, any food that a customer does not finish from his or her plate). If food was diverted to another organization to feed people in need, it is outside the scope of this analysis because it is not food waste.

*Notes:* a. Ten percent is a conservative discount rate when compared with the average cost of capital for market sectors covered by the business sites in our dataset (see Appendix).

FIGURE 1. Financial Benefit-Cost Ratios for Restaurant Sites



Source: WRI and WRAP Analysis.

Across the company sites analyzed, the ratios vary widely, from 0:1 to 27:1. There appears to be no clear correlation between benefit-cost ratios and a site’s market segment or geography.

Drawing on interviews with nongovernmental organizations, food waste measurement experts, and managers involved with some of these surveyed sites, it appears that those locations with higher ratios tended to have one or more of the following features:

- They identified hotspots that consistently produce high levels of waste and prioritized efforts on these hotspots.
- They only needed low capital investments because they already had equipment in place to monitor or reduce food loss and waste (for example, scales, containers, refrigeration units).
- They were highly creative when expanding a pilot food waste-reduction project to other operations. See Box 3 for an example.
- They had high levels of staff engagement with the food waste-reduction program, especially among kitchen staff.

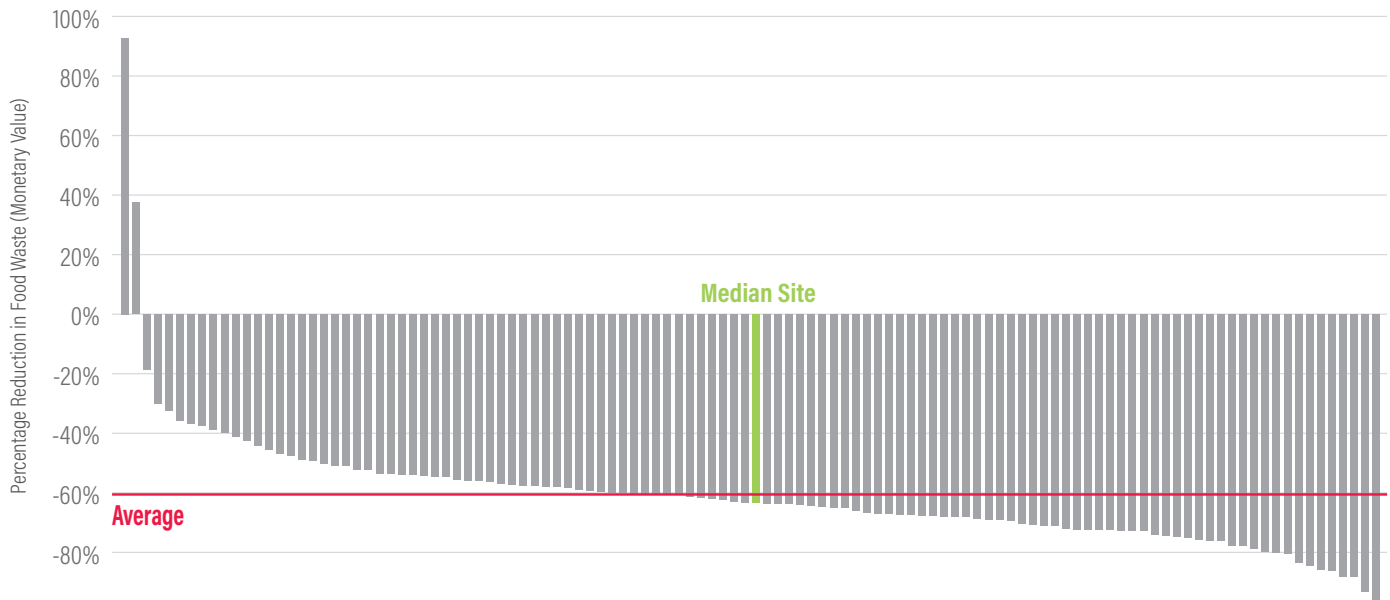
One trait interviewees observed that was associated with some sites with lower ratios was a lack of staff encouragement from management. Although kitchen and service staff are a great source of innovation to reduce food waste, they need to be properly equipped and supported by management to be as effective as possible. Moreover, interviewees indicated that management not only must demonstrate buy-in and commitment but also must be very open to learning from

front-line kitchen staffers. It is important that there is no fear relating to tracking waste and that staff believe that their ideas and suggestions are heard. If employees fear that wasted food will be viewed as emanating from poor performance on their part, they are less likely to track waste accurately and consistently.

Interviews with industry experts revealed that food waste is not typically measured as part of a restaurant’s standard operating procedures. Even in cases where food waste information is gathered (for example, from composting, on-site equipment, or haulers), that information is not always communicated back to food service teams. To be successful, a waste-reduction program needs to address this. Information feedback loops should be created so that front-of-house and kitchen staff can accurately track food waste-reduction efforts. But measurement alone does not reduce waste. Sites should also establish clear targets, test actions, and subsequently assess results against the targets.

Restaurants with the highest ratios went further in their measurement and differentiated between wasted food (that is, caused by over-production, spoiled ingredients, improperly cooked dishes or similar) and the waste of associated inedible parts (that is, peelings, bones). This allowed them to identify potential areas on which to focus their efforts for the greatest financial returns. The greatest financial opportunity typically lies in reducing the amount of wasted food, but repurposing what may be considered inedible parts (for example, peelings) may provide an opportunity to capture further financial and nutritional value.

FIGURE 2. Percentage Reduction in Food Waste (Monetary Value) over the Three-Year Implementation Period



Source: WRI and WRAP Analysis.

## COST REDUCTION

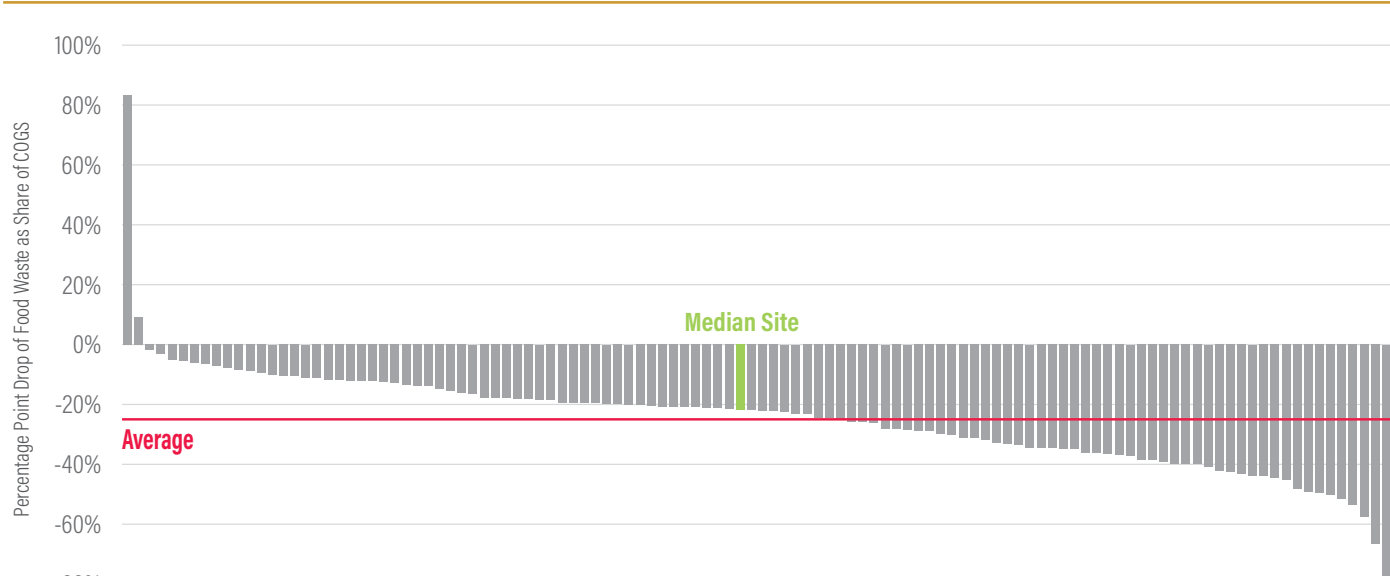
Overall, food waste-reduction efforts in the surveyed sites were highly successful in lowering the amount of food waste. Restaurants achieved an average 26 percent reduction of food waste by weight over a 12-month time frame. Over three years the average site reduced food waste by weight by 58 percent, meeting the UN Sustainable Development Goal 12.3 target of halving food waste. In addition, many site managers prioritized reduction efforts based on the likely economic gain from the reduction (versus an interest in reducing the total weight of waste). Put simply, the economic loss is greater when throwing away products that cost more per kilogram (for example, beef versus potatoes), and many managers prioritized reduction efforts accordingly.

According to interviewees, one way that site managers evaluate the financial effectiveness of their food waste-reduction efforts is to calculate how much the cost of food waste changed as a percentage of COGS (Cost of Goods Sold), also referred to as “food spend.” To illustrate, suppose a restaurant spends \$100 procuring the food (for example, whole food, ingredients) it

sells to customers, and the cost of what was thrown away in the kitchen is \$5. Food waste therefore represents 5 percent of COGS. If the restaurant implements a food waste-reduction program that lowers the cost to \$3, then the restaurant achieves a 40 percent reduction in food waste in terms of monetary value, assuming its food spend is still \$100. This equates to a 2 percentage point drop in the cost of food waste as a percent of COGS (that is, from 5 to 3 percent of COGS).

Figure 2 and Figure 3 summarize the results from the surveyed sites over the three-year implementation period for which this data is available. The average site saw a 61 percent reduction in the cost of food waste (Figure 2). Those sites with increases in the cost of food waste grew in size (that is, increased the total amount of food purchased and sold) enough to exceed any relative reduction in food waste. In other words, these sites may be wasting relatively less at the end of their implementation period, but the absolute value of waste may have increased due to business growth. The average site saw a greater than 2 percentage point drop in food waste as a share of COGS (Figure 3). The median site saw a 2 percentage point drop. In other words, half of the sites saved at least 2 cents on every dollar of COGS.

**FIGURE 3. Percentage Point Drop in Cost of Food Waste as a Percentage of Cost of Goods Sold (COGS) over the Three-Year Implementation Period**



Source: WRI and WRAP Analysis.

**TABLE 1. Annual Food Sales per Site**

ANNUAL FOOD SALES				
Number of Sites	Low	Median	Average	High
114	\$400,000	\$5,200,000	\$5,400,000	\$17,300,000

Source: WRI and WRAP Analysis.

## PAYBACK PERIODS

When implementing food waste-reduction programs, most surveyed sites experienced the bulk of financial costs up front, followed by a steady stream of financial benefits over time. Recurring costs to support food waste-reduction programs are relatively inexpensive. Costs included conducting food waste inventories, training staff on new food handling and storage procedures, and redesigning menus. Benefits included reduced food costs (for example, buying less food due to reduced waste levels), increased revenue from new menu items (for example, turning leftovers or repurposing food which was previously discarded into new salable dishes), and lower waste management costs (for example, sending less food to a landfill via a waste management company).

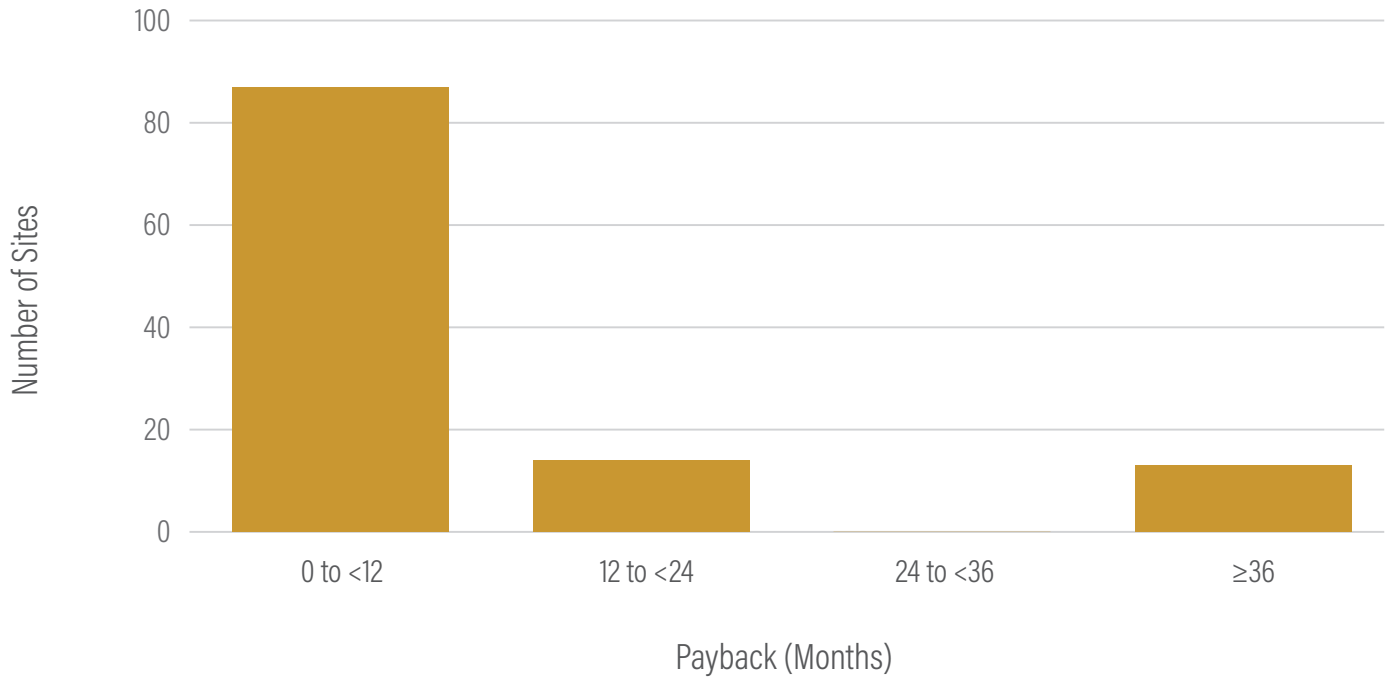
With this timing of financial flows in mind, we calculated the payback period for each site, assuming a linear flow of financial benefits over three years (Figure 4). The payback period indicates how long a food waste-reduction program must operate before surpassing a 1:1 benefit-cost ratio. Within the first year of implementing a food waste-reduction program,

76 percent of the sites recouped their investment. Within two years, 89 percent of the sites surpassed a 1:1 benefit-cost ratio.

## INVESTMENTS MADE

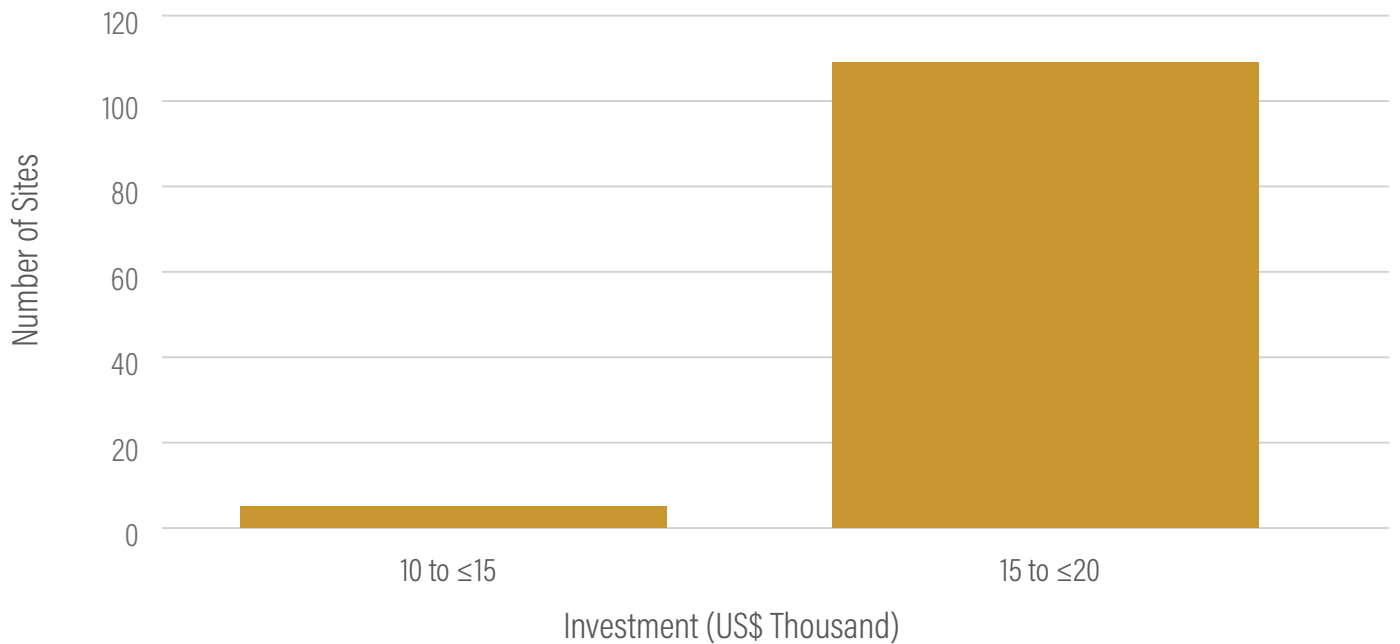
The food waste-reduction programs implemented by the surveyed sites were relatively inexpensive in terms of absolute dollars spent. All sites were able to keep their total investment in food waste reduction between \$10,000 and \$20,000 over the three-year period (Figure 5). These costs consisted of purchasing smart scales or similar measurement technology and training staff in measurement and techniques to reduce waste. Many sites were able to keep their total investment low by embedding food waste measurement into their existing operating systems. Smart scales are tools installed in the kitchen that record the amount, composition, and value of food waste with an easy-to-use, customizable user interface. Examples of smart scales are tools sold or leased by the firms LeanPath and Winnow. LeanPath and Winnow have also developed tools to estimate your business’s food waste and potential savings. These tools are available on their websites.

FIGURE 4. **Distribution of Payback Periods**



Source: WRI and WRAP Analysis.

FIGURE 5. **Investment in Food Waste Reduction per Site**



Source: WRI and WRAP Analysis.

The waste reduction programs were inexpensive relative to annual food sales, as well. The average cost to invest in food waste reduction was only 0.4 percent of annual food sales. For context, these sites ranged from \$400,000 to \$17,300,000 in annual food sales. The average site had \$5,400,000 in annual food sales (Table 1).

## STRATEGIES EMPLOYED

Although specifics varied between sites, interviewees pointed consistently to five types of actions they pursued to achieve successful food waste reduction:

1. **Measure.** Conducting a quantification of food waste generates a food waste inventory that enabled sites to identify *how much* and *where* food was being wasted. Such an inventory then helped managers prioritize hotspots to tackle and to monitor progress over time. All of the surveyed sites used smart scales and measurement systems. Box 2 provides a case example of a small food waste initiative that employs manual measurement, while Box 3 provides a case example of a large food waste initiative that employs smart scales. We cannot independently verify the figures in these case studies, which were provided by the featured sites themselves. Based on our interviews with food waste measurement experts, we recommend that sites who want detailed analysis of their data use digital tools to measure their food waste. Manual measurement systems are available and provide the user with a basic overview of where food waste occurs, typically at a very low cost. However, manual measurement systems tend to underreport waste and thus may not capture all opportunities to reduce waste. In many cases, chefs report that accurate measurement of food waste via smart scales gives them better control over their kitchen and a better understanding of food order patterns.
2. **Engage staff.** According to interviewees, staff engagement was a key variable that determined the success of a food waste-reduction program among the surveyed sites. Kitchen and service staff often want to help prevent food waste at work but need more definition and guidance from leadership. This guidance, for example, could come in the form of daily staff meetings, casual conversations, formal training, or even establishing peer learning opportunities. Management should also work to remove any perception of blaming staff for causing waste. If staff fear they will be blamed for wasting food, rather than rewarded for measuring it, staff engagement will quickly decline. Many restaurants find that the most innovative ideas for reducing a kitchen's waste come from kitchen and front-of-staff staff themselves, not from management. According to interviews, on-site kitchen staff often developed some of the most creative and effective strategies to combat waste, and management should encourage collaboration among sites via pilot programs and cross-site peer learning opportunities. Managers should also build rewards into a food waste-reduction program to drive desired behavior change and engagement among staff. Factors that make the efficacy or efficiency of staff engagement more difficult are menus that change frequently and high rates of staff turnover. Such factors can lead to cyclical patterns of waste wherein the reduction program works as intended for a period of time, but thereafter waste levels drift upward. To combat this, interviewees recommend that managers embed the importance of food waste prevention and tactics to achieve it into their standard training and operating procedures.
3. **Reduce overproduction.** Food waste measurement helps many restaurants find opportunities to safely scale back production while still meeting customer demand. This measurement can help kitchen managers and chefs refine their production sheets over time. Simply tracking production and waste consistently can help identify waste hotspots, and many restaurants find that overproduction is responsible for a large proportion of their food waste. Routinely overproducing food can result in high levels of waste, as this overproduced food cannot always be repurposed or valorized in a different way. While spoiled food or returned orders, for example, can contribute to restaurant food waste, many find that focusing on scenarios that lead to overproduction can reap the most rewards for the least cost. Certain production techniques contribute to a culture of overproduction. For example, batch cooking, casserole trays, and buffets tend to overproduce food relative to cook-to-order preparation. Many restaurants employ these types of preparation as a means to save time and money but fail to consider the hidden costs of food waste. Once a restaurant begins to measure food waste, they often find that these shifting away from these preparation methods can save much more money through food waste reduction.
4. **Rethink inventory and purchasing practices.** Restaurants that want to prevent food waste need to critically examine their current inventory management



and purchasing practices. If a restaurant is 1) measuring its waste and production schedules, 2) engaging staff, 3) and working to reduce overproduction (especially in waste hotspots), the restaurant should then consider deeper adjustments to their inventory and purchasing practices in order to further streamline their standard operating procedures and reduce waste. For example, a restaurant could negotiate with its suppliers for a different delivery schedule that better fits the restaurant's specific needs based on historical trends and waste data. Or, a restaurant could use historical waste data and qualitative information gleaned from staff engagement to restructure its inventory management system and tailor it to the restaurant's specific circumstances.

5. **Repurpose excess food.** Because forecasting customer demand is not a perfect science, restaurant kitchens will find themselves with extra ingredients and potential wasted food. In these cases, having a Plan B for how to safely repurpose these ingredients can allow the kitchen to generate revenue from this potential waste. For example, unsold meat intended for breakfast may be a potential ingredient for a lunch or dinner dish. Restaurants with a set cycle menu can make "re-use" a part of their operations through a rotating menu slot that features unused items from earlier in the week. Sites that incorporated previously unused food (for example, peels, seeds, skins, bones) into dishes were able to produce value from items that typically go straight to the waste bin. For example, making soup stock from such items can cut down on costs if soup stocks were previously purchased and can create added value through new soups and other dishes. While this analysis does not include any potential financial benefit from food donation, the authors urge restaurants to offer edible, unsalable food to organizations that can distribute it to people in need, rather than throwing it away. Interviews indicate that donations also display corporate values and can increase employee participation in a food waste-reduction strategy.

## BOX 2. The Ship Inn

The Ship Inn is a traditional pub near Barrow in Furness, Cumbria, in the United Kingdom. It focuses on home cooking. Managers at the Ship Inn noticed some routine plate waste from customers and hoped to improve its financial margins through food waste reduction.

Achieving these results included the following key actions:

**1. Measure.** The Ship Inn started with manual measurement, sorting waste into "spoilage," "prep," and "plate waste" bins that were measured at the end of each day. This process was extremely cost-effective to implement and provides a rough overview of waste patterns without much time investment. If a restaurant wants a more detailed analysis of their waste (e.g., by meal, by ingredient, by type of dish) with a simple user interface, they may wish to consider digital tools.

**2. Start small.** The Ship Inn made changes to their operating procedures gradually, making sure to only implement one change at a time. This allowed staff to properly assess the effectiveness of each change individually and also build momentum in their new operations. A gradual approach can help better engage staff, giving them more ownership and agency in the process of change.

**3. Let the results speak for themselves.** The Ship Inn did manual measurement for a 4-week trial period and achieved spoilage reduction by 84% (through waste awareness among kitchen staff, resulting in improved working practices). Plate waste was also reduced by 67% (primarily through portion size options and removing garnishes, which have been popular changes with customers). Between week one and week four, total waste reduced by a massive 72%. Such a trial period can improve staff and customer understanding of the initiative, which can make a long-term waste reduction program more effective.

## BOX 3. IKEA Food

The first IKEA store opened in 1958 and today IKEA has over 400 stores in 52 markets. IKEA offers well-designed, high-quality home furnishing, produced with care for people and the environment. There are several companies with different owners working under the IKEA Brand, all sharing the same vision: to create a better daily life.

Close to one billion people visit IKEA every year, and 680 million enjoy the IKEA Food offer. IKEA Food had a turnover of €2.15 billion in fiscal year 2018 and over 18,000 co-workers work within the IKEA Food business around the world. Food has always been an important part of IKEA. Today, IKEA restaurants, IKEA Bistros, and IKEA Swedish Food Markets are central parts of the IKEA concept.

Through its "Food is Precious" initiative, IKEA Food has set a target to reduce its food waste by 50% by the end of August 2020. This initiative started in December 2016. To date, this initiative has been highly successful and continues to be rolled out in its global markets.

Achieving these results included the following key actions:

**1. Measure.** In February 2015, 4 IKEA stores – 2 in the UK and 2 in the US – started pilot programs with the help of two vendors: LeanPath and Winnow Solutions. Though initially scheduled for three months, the pilots were extended to six months to secure more reliable results. The pilot program resulted in a 23-54% decrease in food waste over 6 months of using a "smart scale" system. Concrete results from this extensive pilot program were a key factor in getting IKEA co-workers on board to implement the program, both on a management level in each of the IKEA markets and within the operation of each store.

The smart scales are simple and user friendly, which has helped IKEA expand its food waste reduction program while minimizing the burden on co-workers.

**2. Engage Staff.** IKEA believes that the "human factor" is key to the success of implementation. Implementing a food waste reduction program requires people to change their behavior. Thus, it was very important to IKEA that Food Waste Champions were appointed in each store based on co-workers who got a key role in implementing the program in stores and those who would motivate their colleagues to reach the ambitious goal of halving the food waste. This has proved to be very valuable for effective implementation, as well as to motivate co-workers to change their behavior when it comes to food waste both at work and at home.

IKEA has designated a "Country Implementation Responsible," or CIR, for every market in which the program is implemented. These CIRs are tasked to spearhead implementation in the country and provide relevant support and motivation for other co-workers. Additionally, every store has identified a co-worker who is a "Food Waste Champion." Champions take on the extra responsibility of ensuring that the program is used as intended and to motivate others to engage in the program, also when the program is transferred into being more of a line-business.

Surveys show that 50% of co-workers who are working with the initiative are inspired by IKEA's leadership and are taking steps to reduce food waste at home.

**3. Continue looking ahead.** IKEA saw a 20% reduction in food waste within 12 weeks of implementing its food waste reduction program, and most IKEA sites had a 20-week payback period. Rather than being content with this achievement, IKEA has continued to roll out its "Food is Precious" initiative and internally make the business case for food waste reduction.

IKEA has continued to look ahead at future challenges and obstacles across its many companies. For example, IKEA worked closely with its partners at Winnow and LeanPath to align their technical tools across the variety of IT systems across all IKEA operations. By smoothing the bumps in the road, IKEA has been able to roll out its food waste reduction program more successfully and see better financial returns.

Finally, IKEA plans to address food loss and waste with its suppliers throughout the value chain and also inspire and enable consumers to reduce food waste at home.

## A CALL TO ACTION

Our analyses find that there can be a strong financial business case for restaurants to reduce food waste within their operations. These findings should encourage managers in this sector to start seriously exploring what they can do to reduce food waste and reap the benefits. What then are next steps? We recommend that restaurants follow a three-step approach:

- **Target.** Targets set ambition, and ambition motivates action. Restaurants should adopt a voluntary reduction target of 50 percent by 2030, which is aligned with Target 12.3 of the Sustainable Development Goals.
- **Measure.** What gets measured gets managed. Restaurants should start to measure their food loss and waste and monitor progress toward achieving the target over time. The Food Loss and Waste Accounting and Reporting Standard (FLW Protocol 2016) can help entities proceed with measurement. Leading companies are publicly reporting their food waste data, and we recommend that restaurants begin to do so as well.

- **Act.** Action is what ultimately matters. Restaurants—working alone and together—should take measures like those described in this publication to reduce food waste. A key success factor for action, as we discussed, is management engagement.

Target, measure, and act. If enough companies do this, the world will take a big step toward a future that improves financial performance, food security, environmental protection, and prosperity for all.

## APPENDIX

GLOBAL				
Sector	Number of businesses	Average cost of equity	Average cost of debt	Average cost of capital
Beverage (Alcoholic)	212	8.6%	4.6%	7.8%
Beverage (Soft)	104	10.2%	4.6%	9.1%
Food Processing	1228	8.4%	4.6%	7.6%
Food Wholesalers	119	7.5%	4.6%	6.9%
Retail (Grocery and Food)	172	8.2%	4.6%	7.5%
Hotel/Gaming	651	9.2%	4.6%	8.3%

USA				
Sector	Number of businesses	Average cost of equity	Average cost of debt	Average cost of capital
Beverage (Alcoholic)	22	7.9%	4.0%	7.1%
Beverage (Soft)	43	9.2%	4.0%	8.2%
Food Processing	89	7.6%	3.5%	6.8%
Food Wholesalers	14	6.6%	4.0%	6.1%
Retail (Grocery and Food)	17	8.5%	4.0%	7.6%
Hotel/Gaming	73	8.1%	3.5%	7.2%

EUROPE				
Sector	Number of businesses	Average cost of equity	Average cost of debt	Average cost of capital
Beverage (Alcoholic)	51	7.2%	4.4%	6.6%
Beverage (Soft)	18	7.3%	4.4%	6.7%
Food Processing	156	8.2%	4.4%	7.4%
Food Wholesalers	13	6.4%	4.4%	6.0%
Retail (Grocery and Food)	31	10.8%	4.4%	9.6%
Hotel/Gaming	122	9.3%	4.9%	8.4%

EMERGING				
Sector	Number of businesses	Average cost of equity	Average cost of debt	Average cost of capital
Beverage (Alcoholic)	117	10.3%	5.3%	9.3%
Beverage (Soft)	33	12.7%	5.3%	11.2%
Food Processing	815	96.0%	5.3%	8.7%
Food Wholesalers	53	8.7%	5.3%	8.0%
Retail (Grocery and Food)	61	9.6%	5.3%	8.8%
Hotel/Gaming	399	10.0%	5.3%	9.1%

Source: Authors' calculations for listed private-sector companies based on five-year financial performance data from NYU Stern Business School's international data, accessible at: [http://people.stern.nyu.edu/adamodar/New\\_Home\\_Page/data.html](http://people.stern.nyu.edu/adamodar/New_Home_Page/data.html).

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## ENDNOTES

1. A benefit-cost ratio of 2:1 is equivalent to a 100 percent return on investment (not a 200 percent return on investment as may be mistakenly believed). With a ratio of 2:1, the entity expends \$1 of costs and receives \$2 worth of benefits. The ratio is the same with a 100 percent return on investment. The investor invests \$1 and receives \$2 in return. The pure profit is \$1 while the investment itself is another \$1, thus the profit is 100 percent more than the investment.

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This publication represents the views of the authors alone.

Note: All tons are metric tons and all dollars are U.S. dollars, unless otherwise noted.

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