

# Estimating Factors for Edible Food Disposed by Commercial Edible Food Generators

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CalRecycle has created this document to assist counties, cities, regional agencies, and special districts in meeting capacity planning requirements under SB 1383. This guidance document accompanies the [SB 1383 Edible Food Recovery Capacity Planning Calculator](#) (calculator) which helps estimate the amount of edible food disposed by tier 1 and tier 2 commercial edible food generators, as defined in the SB 1383 regulations.

The calculator is designed for the user to input a factor representing the average pounds of edible food disposed per facility per year (Step 3) for each commercial edible food generator type and then input the number of commercial edible food generators, by type (Step 4a). These two values are then multiplied to produce an output showing the estimation of edible food disposed by commercial edible food generator type. Users can reference the guidance in this document to generate the factors for Step 3 of the calculator or they can use factors derived from other sources, including local waste characterization studies. Users can also provide optional information in Step 4b to estimate edible food disposed by food type (e.g., vegetative, packaged non-perishable, etc).

This document provides guidance on identifying and assessing existing data sources that can be used in Steps 3 and 4b of the calculator, including multiple tables with

existing data sources. The document is organized into four main sections that address the following topics:

1. Data requirements of the calculator to estimate edible food disposed by commercial edible food generators
2. Selecting edible food conversion factors for step 3 of calculator
3. Delineating estimate of edible food disposed by food type for optional step 4b
4. Tables with potential data to use and details of data limitations.

The calculator is designed to estimate edible food disposed by commercial edible food generators using factors that represent the average amount of food waste by commercial edible food generator type, not using facility or site-specific data. The estimates and data provided in this document represent averages across broad industry groups, meaning that the industry group estimate may include data from facilities that are not commercial edible food generators under SB 1383. Additionally, the amount of edible food disposed may vary widely within an industry group based on many factors, including regional infrastructure and the size of a facility.

When referencing any potential sources of data, one must be careful that the units used in the source are consistent with those used in the calculator. The calculator requires a factor for each commercial edible food generator type in the units of **pounds of edible disposed per facility per year**. External sources of data are often provided in other units. For example, some datasets come in units of pounds of edible food disposed per employee at a facility per year or pounds of total food waste generated per year. Section 2.2 provides guidance for converting external sources of data to the units used in the calculator. This includes factors for converting per-employee estimates to facility-level estimates and conversion factors for estimating what proportion of total food waste is “edible.”

For clarification on requirements, please reference the edible food recovery regulatory language (14 CCR Division 7, Chapter 12, Article 10) and edible food recovery capacity planning requirements (14 CCR Division 7, Chapter 12, Article 11).

The information and data sources identified below are publicly available or are unpublished CalRecycle data from the 2018 Generator-Based Waste Characterization sub-study. CalRecycle does not promote or endorse any specific data source. To aid users in the evaluation of the appropriateness of the data sources to their individual goals, CalRecycle has identified the limitations and assumptions inherent to each source.

Contact Information if questions about document? Contact your CalRecycle Local Assistance and Market Development liaison if you need assistance.

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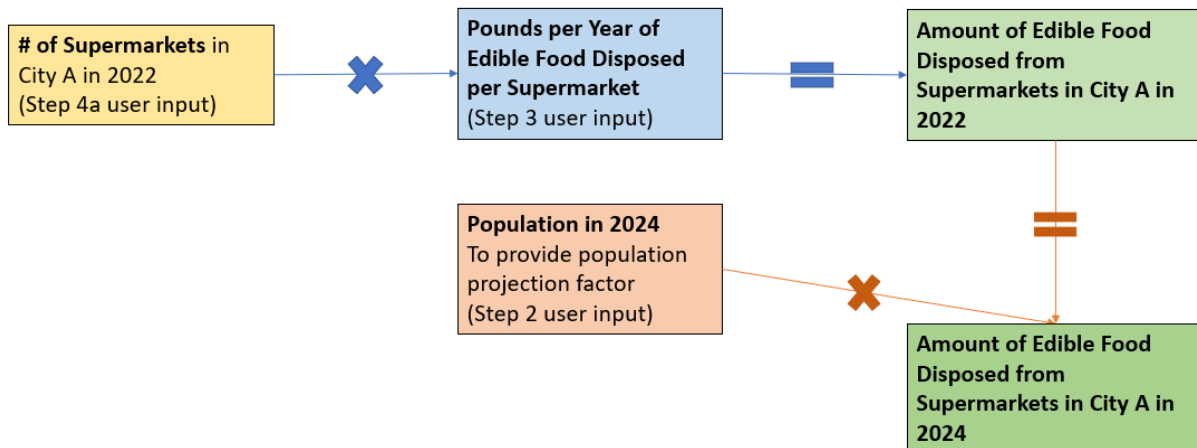
# 1. Data Requirements of the Calculator

In order to estimate the annual amount of edible food disposed by commercial edible food generators in a jurisdiction, users of the calculator need to input two key numbers for each type of commercial edible food generator in Steps 3 and 4a:

- 1) **Step 3:** A factor representing average pounds of edible food disposed per facility per year, by type of commercial edible food generator (e.g., average pounds of edible food disposed per supermarket per year)
- 2) **Step 4a:** The number of commercial edible food generator facilities of each type in your area (e.g., number of supermarkets in your jurisdiction). (For more information and best management practices for identifying commercial edible food generators, please see the guidance document on [how to identify tier one and tier two commercial edible food generators.](#))

The calculator then multiplies these values to estimate the annual amount of edible food disposed by commercial edible food generator type for the reporting year (see Figure 1 below for an illustration using supermarkets as an example). The calculator will also provide an estimate of edible food disposed in that target year (i.e., the last year of the reporting period) if the user inputs population projections for the target year in Step 2.

**Figure 1. Visual Representation of How the Edible Food Recovery Capacity Planning Calculator Works Using the Example of Supermarkets**



## Large Events

Estimating the amount of edible food disposed by large events in the calculator is slightly different from the other commercial edible food generator types, which use **per facility** inputs. Large events use **per event** inputs, meaning that users should provide a factor for pounds of edible food disposed **per event** in Step 3 and provide the **number of events** that meet the commercial edible food generator criteria in Step 4a. Events that occur at a large venue should not be considered a large event on their own, because that would result in double counting. Large events should only include events

that do not take place at one of the large venues identified as a commercial edible food generator.

## **2. Selecting Edible Food Disposal Conversion Factors (Step 3 of Calculator)**

Users of the calculator can identify appropriate conversion factors to estimate edible food disposed by commercial edible food generator type in Step 3. The focus of this section is to help users identify, select, and modify factors to be used in the calculator.

Users may also opt to utilize factors derived from other sources such as local waste characterization estimates.

The calculator requires a factor for each commercial edible food generator type in the units of **pounds of edible food disposed per facility per year**, except for large events, as described in the previous section. Datasets are often provided in other units (e.g., pounds of food waste per employee per year). Additionally, these estimates may capture more than just edible food disposed (e.g., total food waste generation). The calculator was designed to input the pounds of edible food per year, per generator type, only.

The next sub-section (2.1) provides information on existing datasets that can be used to estimate pounds of edible food disposed per facility per year. This includes major limitations to consider when users are deciding which data to use. Sub-sections 2.2 and 2.3 of this document will guide the user through the conversion of that data into the units required for the calculator after the most appropriate data source is selected.

There is not yet a single existing dataset available from CalRecycle or other entities that can provide the needed information. As a result, users must decide on which data to use and make adjustments, as necessary, based on which assumptions are most applicable to their situation and which limitations are most acceptable for their capacity planning purposes.

### **2.1 Available Data by Type of Commercial Edible Food Generator**

This section provides information on two available datasets with estimates of food waste for industry groups that include commercial edible food generators (see Table 1).

Neither dataset provide all the necessary estimates. Thus, the user must decide which data points to use by commercial edible food generator type based on the availability and the main limitations of the data. Additionally, both datasets are limited by the fact that they represent broad industry groups that may include facilities that are not considered commercial edible food generators.

Table 1 provides a set of estimates relevant to commercial edible food generator types for each data set. Each study is limited to one column, while each commercial edible food generator type has its own row to allow for comparison between reported estimates. The main limitations or assumptions have been identified for each source

and are presented as footnotes to Table 1. Reference the original dataset (links provided below) for more data and detailed information on the methodologies and limitations.

If usable data for a commercial edible food generator type was not identified within a given study, the corresponding cell has been marked n/a. It should be noted that Table 1 does not provide exhaustive list of data provided by each dataset. No dataset provides estimates for food waste from food service providers. Users of the tool can choose to use the factors for restaurants or can identify another data point that can serve as a proxy. For example, if the main food service providers in your area serve colleges and universities, an estimate for food waste at colleges and universities, such as the one provided in the Natural Resources Defense Council reports, may be applicable.

The remainder of this sub-section provides brief summaries for each of the identified datasets.

### **Dataset 1: CalRecycle’s 2018 Generator-Based Waste Characterization Sub-Study**

The 2018 CalRecycle Generator-Based Waste Characterization sub-study provides estimates in the proper units for the calculator (average pounds of edible food disposed per facility per year) for some commercial edible food generator types. Although these estimates are based on small sample sizes, the estimates were created by direct measurement of food waste at facilities across California in 2018, thus the data reflects California-specific facilities. This data has not been previously published but was collected as part of the 2018 waste characterization study. Samples were collected on site from a small number of industry groups, and food waste was sorted into eight categories based on edibility and type. For more information on how food waste was sorted into categories, see sub-section 2.2.1 or the materials list of the [2018 Disposal-Facility-Based Characterization of Solid Waste in California](#).

### **Dataset 2: Reports by the Natural Resources Defense Council (NRDC)**

The NRDC released a report entitled [“Estimating Quantities and Types of Food Waste at the City Level: Technical Appendices”](#) in 2017. This report provides detailed information on the methodology used to estimate how much food was wasted in three U.S. cities. NRDC provides their own estimates and documents sources of other estimates from various studies across the United States used in their analysis. The estimates are for food waste generation (or total food waste), not just food that is landfill disposed. The estimates provided in Table 1 are the amount of food waste per employee, visitor, bed, or sales revenue. Please reference Appendices K and L in the report for other data and more information on the sources.

The NRDC also released a report entitled [“Modeling the Potential to Increase Food Rescue: Denver, New York City, and Nashville”](#) in 2017 which estimated the amount of recoverable food in three cities. Estimates included in the narrative of the report are

used to provide estimates of the amount of total food waste that is recoverable by industry group (see Table 2).

## **2.2. What is “Edible Food Disposed”?**

### **Ensuring Factors Capture the Appropriate Numbers**

Under SB 1383, capacity planning for edible food recovery requires counties, cities, regional agencies, and special districts that provide solid waste collection services to estimate the amount of edible food disposed by commercial edible food generators. In the regulations, edible food is defined as food intended for human consumption. The regulatory definition also specifies, however, that nothing in the regulations requires or authorizes the recovery of edible food that does not meet the food safety requirements of the California Retail Food Code. For food to be considered “edible” as required by SB 1383, the food must be intended for human consumption.

To estimate the amount of edible food disposed by commercial edible food generators, it is important to recognize that “edible food disposed” is a subset of total food waste. Specifically, factors input into the calculator should only include the **edible portion** of food waste that is **sent to landfill disposal**, in alignment with SB 1383. Many published estimates include more than the edible portion, including estimates of total food waste that include all food materials that are disposed. Some estimates of edible food wasted may use a definition of “edible food” different from the definition under SB 1383. For example, some definitions of edible food simply indicate whether the food *could have been eaten*, and not whether the food could be safely recovered prior to the point of disposal. In this example, a partially eaten burrito would be considered edible, but not edible and recoverable. Additionally, some estimates of food waste include food sent to discard destinations other than landfill disposal (e.g., composting), thus estimates need to be altered to only include landfill disposal.

Users can estimate what proportion is “edible food disposed” from estimates that include other discard destinations or food waste that would not be considered edible and recoverable under SB 1383. The two following sub-sections provide methods to ensure factors input into Step 3 capture “edible food disposed,” focusing on edibility and disposal.

#### **2.2.1. Considering Only “Edible” Food: Potentially Donatable and Recoverable Food Waste**

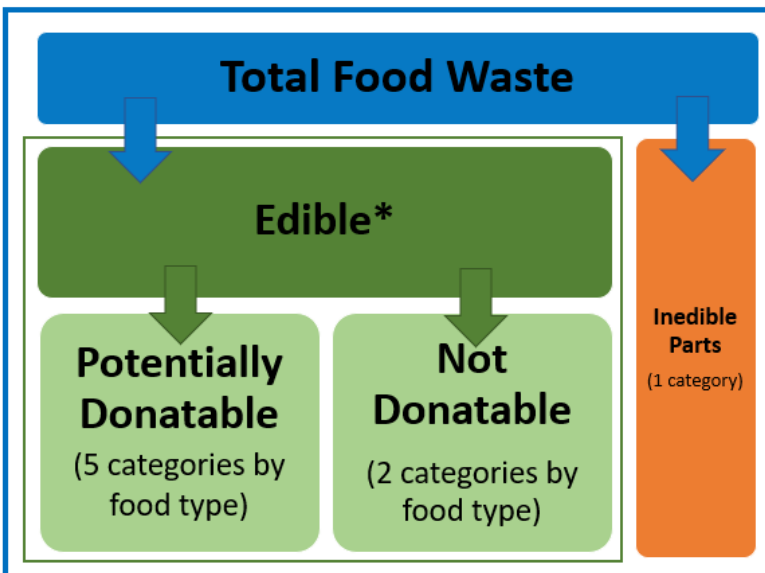
Table 2 provides factors for converting estimates of total food waste to only include the “edible” portion using either CalRecycle or NRDC data. The CalRecycle dataset provides factors for converting total food waste to “potentially donatable” food waste, while one NRDC report provides a range of estimates of the proportion of food waste that is “recoverable,” meaning that it could have been recovered safely for human consumption.

CalRecycle’s 2018 Disposal Facility-based Waste Characterization Study (WCS) captures the concept of edibility by first delineating between edible food and inedible

parts (e.g., banana peels or eggshells) (see Figure 2). Within edible food, discarded food is characterized as being “potentially donatable” or “non-donatable” based on whether it was likely that the food could have been safely recovered for human consumption prior to discard. Potentially donatable categories include items discarded whole or in a manner that would have made it potentially recoverable (e.g., discarded in unopened original packaging), while non-donatable categories include items that were partially eaten or discarded in open packages.

For the purposes of the calculator, “edible food” is considered food intended for human consumption while acknowledging that commercial edible food generators are not required to recover edible food that does not meet the food safety requirements of the California Retail Food Code, similar to potentially donatable food as defined in the WCS.

**Figure 2. Eight Categories of Food Waste in CalRecycle’s 2018 Waste Characterization Study, by Edibility and Food Type**



\*May contain some inedible parts. Specifically, items thrown away whole (e.g., a whole watermelon) would be considered “potentially donatable” but would include some inedible parts (e.g., the watermelon rind).

The NRDC report “Modeling the Potential to Increase Food Rescue: Denver, New York City, and Nashville” provides ranges for the portion of total food waste that is “recoverable,” meaning that it can be safely recovered prior to discard (see Table 2).

Both the NRDC and CalRecycle datasets only include information for some of the commercial edible food generator types. If no industry-specific factor is available, users of the calculator can use the estimate for the California commercial sector derived from the 2018 Disposal Facility-Based CalRecycle Waste Characterization Study. That study estimated that 22 percent of total food waste disposed in the commercial sector was



potentially donatable. Although users could apply this percentage across all mandated food donor types (see Example 1 below), this may lead to overestimations of edible food waste as the proportion of total food waste that is recoverable varies significantly by generator type.

**Example 1: Converting Total Food Waste to Edible Food Waste**

$$\left( \frac{\text{\# pounds of food waste disposed}}{\text{per supermarket per year}} \right) \left( \frac{22\% \text{ edible food}}{100\% \text{ of food waste disposed}} \right) = \left( \frac{\text{\textbf{pounds edible food disposed}}}{\text{\textbf{per supermarket per year}}} \right)$$

**2.2.2. Considering Only Food Waste “Disposed”**

Many available estimates of food waste include discards beyond landfill disposal, such as compost. If a user wants to use an estimate for food waste that includes more discard destinations than disposal, they can use a conversion factor that estimates the proportion of total food waste that is disposed to a landfill (see Example 2).

What proportion of total food waste generation is sent to landfill disposal may vary significantly by region or waste management infrastructure. In an area with limited collection of food materials for recycling, total food waste generation may be essentially the same as food waste disposal. In areas with robust collection services, a significant proportion of total generation may go to organics recycling, not disposal. Users should choose a factor that makes sense given regional infrastructure.

CalRecycle’s [2014 Generator-Based Characterization of Commercial Sector Disposal and Diversion in California](#) estimated the recovery rate of many “standard recoverable materials” in commercial curbside collection. It was estimated that 7.5 percent of food waste generated by the commercial sector was recovered through curbside commercial organics collection, meaning that 92.5 percent of the food was disposed (see Example 2). The major limitations of using this estimate are that it represents the entire commercial sector and was estimated in 2014. The 2014 Generator-based study also provides some estimates on recovery rate by broad industry groups, such as Medical & Health; and Food & Nondurable Wholesale Manufacturing.

**Example 2: Converting Total Food Waste to Food Waste Disposed**

$$\left( \frac{\text{\# pounds of food waste generation}}{\text{per supermarket per year}} \right) \left( \frac{92.5\% \text{ landfill disposal}}{100\% \text{ of food waste generation}} \right) = \left( \frac{\text{\textbf{pounds food disposed}}}{\text{\textbf{per supermarket per year}}} \right)$$

### 2.3. Converting Data from Amount Per Employee to Edible Food Disposed Per Facility

The calculator requires that users provide factors estimating the average amount of edible food disposed by commercial edible food generator type in the units of **pounds per facility per year**. Some existing data sources, including the NRDC data, provide estimates in other units, such as **pounds per supermarket employee per year**. In this example, food waste estimates are normalized by the number of employees. However, other estimates normalize the estimates by sales (in dollars), square footage, or other factors.

To use a normalized estimate of food waste as a factor in the calculator, the user must first convert the estimate to **pounds per facility per year**. To do this, a conversion factor is needed. Using the example of a per-employee estimate, the conversion factor would transform the estimate from a per-employee number to a per-facility number. In this case, the conversion factor would be the average number of employees per facility. Given that per-employee estimates are the most common type of normalized estimate, we provide more detail below on how to convert from a per-employee to a per-facility estimate, including potential sources of data to allow for that conversion (see Table 3).

California's Employment Development Department's (EDD) [Quarterly Census of Employment and Wages Data Search Tool](#) provides annual and quarterly information on employment, including number of establishments and average monthly employment by ownership (e.g., privately owned, government owned). This data is provided at the statewide level and by county. Information and estimates are provided by industry group using the [North American Industry Classification System \(NAICS\) Code](#), which is a standardized business group classification system. Some NAICS codes encompass industry groups that are broader than the type of commercial edible food generator, thus estimates will also include non-targeted entities.

For example, the NAICS code 445110 is for "Supermarkets & Other Grocery Stores Except Convenience Stores" which includes supermarkets, grocery stores that meet the Tier 1 threshold definition, and also grocery stores that do not meet the minimum threshold to be considered a commercial edible food generator. Additionally, data from EDD is not available for every type of commercial edible food generator because specific NAICS codes do not exist for every industry group.

See Table 3 for a list of NAICS codes associated with each commercial edible food generator type. The table also includes statewide factors for number of establishments in California and average employees per establishment using 2019 EDD data for privately owned establishments. For local education agencies, data for both private and local public schools was included.

[Data on number of employees and number of establishments](#) is also available for counties and metropolitan areas through EDD. To use this data to determine a factor of average employees per facility, divide the data on number of employees by the number

of establishments. EDD data may not be available for every type of commercial edible food generator by county or metropolitan area due to [suppression, where data is not provided because it could be used to identify specific facilities or businesses](#). This is an issue that tends to be magnified for small counties and small industry groups. In this case, users could opt to use the statewide factors provided in Table 3.

In some cases when data is suppressed by EDD (e.g., warehouse clubs and supercenters with NAICS code 452910), data on number of establishments and employees at the county and metropolitan area is available from the [U.S. Census' Retail Trade information](#). The major limitation of the U.S. Census' Retail Trade Information is that it was last updated with 2012 data.

Information on the number of employees at state agencies in California can be found in the [State Agency Waste Management Annual Reports](#) tracked by the State Agency Reporting Center (SARC). Users can search for state agencies by name, zip code, or city. Each report provides information on the number of employees.

**Example 3: Converting Normalized Food Waste Estimates to Per Facility Estimates**

$$\left( \frac{\text{\# pounds edible food disposed}}{\text{per supermarket employee per year}} \right) \left( \frac{39 \text{ employees}}{\text{per average supermarket}} \right) = \left( \frac{\text{pounds edible food disposed}}{\text{per average supermarket per year}} \right)$$

**2.4. Example of the Converting Estimates to Appropriate Units for Calculator**

For illustrative purposes, an example is provided below for converting the available data from NRDC to the appropriate units.

**Example 4: Converting NRDC Data to Needed Units and Boundaries**

The NRDC's report estimates that approximately 3,000 pounds of food waste is generated per supermarket employee per year. To convert to the needed units, we first multiply those 3,000 pounds by the average number of supermarket employees per facility to get an estimate of pounds of food waste generation per supermarket. In this case, statewide EDD data results in an estimate of an average of 39 employees per supermarket in 2019 (see Table 3). Then, to convert from food waste generation to food waste disposed, we use an estimate that 50 percent is disposed, given a robust organics collection system in our hypothetical jurisdiction. Finally, to convert from total food waste disposed to edible food waste disposed, we multiply by a conversion factor estimating 29 percent of total food waste disposed was potentially donatable or "edible." That estimate is from the CalRecycle 2018 generator study for supermarkets and grocery stores (see Table 2).

$$\left(\frac{3,000 \text{ pounds of food waste generation}}{\text{per supermarket employee per year}}\right) \left(\frac{39 \text{ supermarket employees}}{\text{supermarket facility}}\right) \left(\frac{50\% \text{ food waste disposed}}{100\% \text{ of food waste generation}}\right) \left(\frac{29\% \text{ edible food}}{100\% \text{ of food waste disposed}}\right) = \left(\frac{16,965 \text{ pounds edible food disposed}}{\text{per supermarket per year}}\right)$$

### 3. Delineating Estimate of Edible Food Disposed Further by Food Type (Step 4b - Optional)

Although not required by SB 1383, Step 4b provides an optional function to split total edible food disposed into food types. This information may be helpful to jurisdictions in planning for food recovery infrastructure and capacity. This could include refrigerated vehicles, additional cold storage, kitchen space, or staffing.

For the tool to estimate totals by food type, the calculator requires the user to provide information on the percentage of each food type of total edible food disposed. Users should confirm that these percentages sum to 100 percent for each commercial edible food generator type. The food types included in the calculator are defined in [CalRecycle's 2018 Disposal-Facility-Based Waste Characterization Study](#), and are as follows:

- 1) Vegetative
- 2) Meat
- 3) Eggs, Dairy, and Dairy Alternatives
- 4) Cooked/Baked/Prepared Perishable Items
- 5) Packaged Non-Perishable

The 2018 CalRecycle Disposal-Facility-Based Waste Characterization Study provides estimates by type on the proportions of potentially donatable food waste disposed in the commercial sector (see Table 4 for statewide commercial sector proportions). These numbers can be used across all commercial edible food generator types. However, the major limitation of this method is that the proportion of total food waste by type can vary significantly by generator type.

The 2018 CalRecycle Generator-Based Waste Characterization Sub-Study also provides estimates on the proportion of potentially donatable food disposed by food type for supermarkets and grocery stores, full-service restaurants, and merchant wholesalers (see Table 5).

## 4. Tables with Potential Data to Use & Details of Data Limitations

**Table 1: Estimates for Food Waste from Various Sources (Units of Estimates Vary by Source)**

<b>Commercial Edible Food Generator Type</b>	<b>2018 Generator-Based Waste Characterization Study</b> (pounds of <i>potentially donatable</i> food waste per facility per year)	<b>Natural Resources Defense Council</b> (pounds of food waste per employee/revenue/bed/visitor per year)
Tier 1: Supermarkets	9,300 pounds per facility per year (factor for Supermarkets and Grocery Stores)	3,000 pounds of food waste <b>per employee</b> per year (factor for Grocers & Markets)
Tier 1: Grocery stores with a total facility size equal to or greater than 10,000 square feet	9,300 pounds per facility per year (factor for Supermarkets and Grocery Stores)	3,000 pounds of food waste <b>per employee</b> per year (factor for Grocers & Markets)
Tier 1: Food service providers	n/a	n/a
Tier 1: Food distributors	128,000 pounds per facility per year (factor for Merchant Wholesalers)	0.01 pounds of food waste <b>per dollar of revenue</b> per year (factor for Food Wholesalers & Distributors)
Tier 1: Wholesale food vendors	128,000 pounds per facility per year (factor for Merchant Wholesalers)	0.01 pounds of food waste <b>per dollar of revenue</b> per year (factor for Food Wholesalers & Distributors)
Tier 2: Restaurants with 250 or more seats or a total facility size equal to or greater than 5,000 square feet	1,900 pounds per facility per year (factor for Full-Service Restaurants)	3,000 pounds of food waste <b>per employee</b> per year (factor for Food Service Sector)
Tier 2: Hotels with an on-site food facility and 200 or more rooms	n/a	1,984 pounds of food waste <b>per employee</b> per year (factor for Hospitality – Hotels)
Tier 2: Health facilities with an on-site food facility and 100 or more beds	n/a	3.42 pounds of food waste <b>per bed</b> per day (factor for Hospitals) 1.8 pounds of food waste <b>per bed</b> per day (factor of for Nursing Homes)
Tier 2: Large Events	n/a	0.6 pounds of food waste <b>per seat</b> per day OR 0.45 pounds of food waste <b>per visitor</b> (factor for Events & Recreation facilities)
Tier 2: Large Venues	n/a	0.6 pounds of food waste <b>per seat</b> per day OR 0.45 pounds of food waste <b>per visitor</b> (factor for Events & Recreation facilities)
Tier 2: State agencies with a cafeteria with 250 or more seats or a total cafeteria size equal to or greater than 5,000 square feet	n/a	5 to 80 pounds of food waste per corporate/business employee per year (range from directly measured data on Corporate Cafeterias/Breakrooms)
Tier 2: Local education agencies with an on-site food facility	n/a	0.15 tons per employee per year (factor for K-12 Schools)

Data from the 2018 Generator-Based Waste Characterization Study only include potentially donatable food waste, while estimates from the NRDC are for total food waste. (2) The conversion factors provided in the NRDC's [Technical Appendices of the NRDC's Report on](#)

[Estimating Quantities and Types of Food Waste](#) are mostly derived from other sources (more information can be found in Appendix L of the report). NRDC also conducted direct measurement of a small number of businesses to estimate food waste (see more information see Appendix K of the report). Due to lack of data, a range using NRDC data is provided for state agencies based on NRDC measurement. “Food service provider” is a defined Tier 1 Commercial Edible Food Generator under SB 1383 while the term “foodservice sector” is a generic term used to encompass facilities that serve food for immediate consumption, such as restaurants. Major Data Limitations: (1) The CalRecycle 2018 Generator-Based Waste Characterization Study had small sample sizes; (2) Both sources provide estimates for broad industry groups that may include facilities that do not fit the definition of a Tier 1 or Tier 2 Commercial Edible Food Generator – see the description of the industry group in parentheses after each estimate; (3) Data from NRDC is not specific to California; (4) Due to lack of data that distinguishes by commercial edible food generator type, multiple commercial edible food generator types use the same factors for food waste estimates. Supermarkets and grocery stores that meet the Tier 1 requirements use the same factor; and food distributors and wholesale food vendors are assumed to have the same factor; (5) The CalRecycle estimate for food distributors and merchant wholesale food vendors is based on sampling from facilities that vary widely in size, including large facilities that increased the average estimate significantly. Excluding the largest facility decreases the estimate to 47,000 pounds per facility per year. Consider using that estimate if your area has smaller facilities.

**Table 2: Conversion Factors for Converting Total Food Waste to Edible, Recoverable, or Potentially Donatable Food Waste**

<b>Commercial Edible Food Generator Type</b>	<b>CalRecycle 2018 Generator Study</b>	<b>Natural Resources Defense Council (NRDC)</b>
Tier 1: Supermarkets	29% of total supermarket/grocery store food waste was potentially donatable	More than 1/3 of total food waste may be recoverable (factor for Grocery)
Tier 1: Grocery stores with a total facility size equal to or greater than 10,000 square feet	29% of total supermarket/grocery store food waste was potentially donatable	More than 1/3 of total food waste may be recoverable (factor for Grocery)
Tier 1: Food service providers	n/a	n/a
Tier 1: Food distributors	n/a	n/a
Tier 1: Wholesale food vendors	73% of total merchant wholesaler food waste was potentially donatable	n/a
Tier 2: Restaurants with 250 or more seats or a total facility size equal to or greater than 5,000 square feet	6% of total full-service restaurant food waste was potentially donatable	1 to 3% of total food waste may be recoverable (factor for restaurants)
Tier 2: Hotels with an on-site food facility and 200 or more rooms	n/a	5 to 10% of total food waste may be recoverable (factor for Hospitality and Healthcare)
Tier 2: Health facilities with an on-site food facility and 100 or more beds	n/a	5 to 10% of total food waste may be recoverable (factor for Hospitality and Healthcare)
Tier 2: Large Events	n/a	n/a
Tier 2: Large Venues	n/a	n/a
Tier 2: State agencies with a cafeteria with 250 or more seats or a total cafeteria size equal to or greater than 5,000 square feet	n/a	n/a
Tier 2: Local education agencies with an on-site food facility	n/a	Up to 16% of total food waste is recoverable (factor for K-12 Schools)

*Major Data Limitations: (1) The CalRecycle 2018 Generator-Based Waste Characterization Study data relies upon small sample sizes and is not representative of the entire industry group in California; (2) Both sources provide estimates for broad industry groups that may include facilities that do not fit the definition of a tier 1 or tier 2 commercial edible food generator; and (3) Data from NRDC is not specific to California and was found in the narrative of the report entitled [“Modeling the Potential to Increase Food Rescue: Denver, New York City, and Nashville.”](#)*

**Table 3: NAICS Codes and 2019 Statewide Factor for Employees Per Establishment from EDD**

<b>Commercial Edible Food Generator Type</b>	<b>Associated NAICS Code</b>	<b>2019 Statewide Number of Establishments by NAICS Code</b>	<b>2019 Average Statewide Factors for Employees Per Establishment by NAICS Code</b>
Tier 1: Supermarkets	445110 (Supermarkets & Other Grocery Stores Except Convenience Stores) and 452311 (Warehouse Clubs and Supercenters)	For 44510: 7,527 establishments For 452311: Data suppressed	For 44510: 39 employees/establishment For 452311: Data suppressed
Tier 1: Grocery stores with a total facility size equal to or greater than 10,000 square feet	445110 (Supermarkets & Other Grocery Stores Except Convenience Stores)	7,527 establishments	39 employees/ establishment
Tier 1: Food service providers	722310 (Food Service Contractors)	2,100 establishments	23 employees/ establishment
Tier 1: Food distributors	4244 (Grocery and Related Product Merchant Wholesalers)	6,112 establishments	18 employees/ establishment
Tier 1: Wholesale food vendors	4244 (Grocery and Related Product Merchant Wholesalers)	6,112 establishments	18 employees/ establishment
Tier 2: Restaurants with 250 or more seats or a total facility size equal to or greater than 5,000 square feet	722511 (Full-service Restaurants), 722513 (Limited-service Restaurants), and 722514 (Cafeterias, Grill Buffets, and Buffets)	For 722511: 30,776 establishments For 722513: 31,022 establishments For 722514: 588 establishments	For 722511: 21 employees/ establishment For 722513: 18 employees/ establishment For 722514: 21 employees/ establishment
Tier 2: Hotels with an on-site food facility and 200 or more beds	72111 (Hotels and Motels except casino hotels)	5,867 establishments	38 employees/ establishment
Tier 2: Health facilities with an on-site food facility and 100 or more rooms	6221 (General Medical and Surgical Hospitals)	551 establishments	691 employees/ establishment
Tier 2: Large Events	n/a	n/a	n/a
Tier 2: Large Venues	n/a	n/a	n/a
Tier 2: State agencies with a cafeteria with 250 or more seats or a total cafeteria size equal to or greater than 5,000 square feet	n/a	n/a	n/a
Tier 2: Local education agencies with an on-site food facility	611110 (Elementary and Secondary Schools)	15,987 establishments	57 employees/ establishment



Using [2019 EDD statewide data on number of employees and number of establishments](#). Data is also available for counties and metropolitan areas. Data provided in this table is for the private sector, excluding government-owned establishments, except for local education agencies. The estimate for local education agencies includes establishments that are privately owned and local government-owned. Major Limitations: (1) NAICS codes are not specifically available for every type of commercial edible food generator; and (2) Some NAICS codes include facilities that are not considered commercial edible food generators.

**Table 4: Breakdown of Potentially Donated Food Waste Disposed by Food Type for the Commercial Sector from 2018 Disposal-Facility-Based Waste Characterization Study**

Potentially Donatable Food Type	Percent of All Potentially Donatable Food Waste Disposed to Landfill by Food Type
Vegetative	54%
Meat	8%
Eggs, Dairy, and Dairy Alternatives	6%
Cooked/Baked/Prepared Perishable Items	11%
Packaged Non-Perishable	21%

The data above is from the [2018 Disposal-Facility-Based Characterization of Solid Waste in California](#) for the commercial sector. The major limitation with using this data in Step 4b is that it does not delineate by commercial edible food generator type. There are likely large differences in the composition of food waste, depending on commercial edible food generator type.

**Table 5: Breakdown of Total Potentially Donated Food Waste Disposed by Food Type for from 2018 Generator-Based Waste Characterization Sub-Study for Some Commercial Edible Food Generator Types**

Potentially Donatable Food Type	Percent of All Potentially Donatable Food Waste Disposed to Landfill by Food Type for <u>Supermarkets and Other Grocery Stores</u>	Percent of All Potentially Donatable Food Waste Disposed to Landfill by Food Type for <u>Merchant Wholesalers</u>	Percent of All Potentially Donatable Food Waste Disposed to Landfill by Food Type for <u>Full-Service Restaurants</u>
Vegetative	61%	77%	45%
Meat	8%	0%	33%
Eggs, Dairy, and Dairy Alternatives	7%	6%	0%
Cooked/Baked/Prepared Perishable Items	18%	9%	14%
Packaged Non-Perishable	6%	9%	8%

*Major Data Limitations: (1) The CalRecycle 2018 Generator-Based Waste Characterization Study data relies upon small sample sizes and is not representative of the entire industry group in California; (2) Both sources provide estimates for broad industry groups that may include facilities that do not fit the definition of a commercial edible food generator.*