4.9 Food Disposals

Garbage disposal with grinder

Overview

Scraping dishes and disposing of food waste prior to dishwashing can be a very water- and energy-intensive process, depending upon the food disposal method used. Typically, commercial kitchens dispose of food scraps using a garbage disposal with a grinder that processes food waste into pieces small enough to pass through the plumbing system.

Garbage disposals in and of themselves do not use water; however, kitchen staff often run water at high flow rates through the garbage disposal to prevent damage to the grinder blades and keep food waste from building up and clogging the plumbing system. Some facilities have a sluice trough, which feeds the garbage disposal and is usually built into a stainless steel table system. Water is applied continuously at the top of the trough, often at a rate of 2.0 to 15.0 gallons per minute (gpm),[50] depending upon how many nozzles are installed. Food waste is scraped into the trough and rinsed down into the garbage disposal. Alternatively, some facilities rinse food from dishes into a garbage disposal using a pre-rinse spray valve.

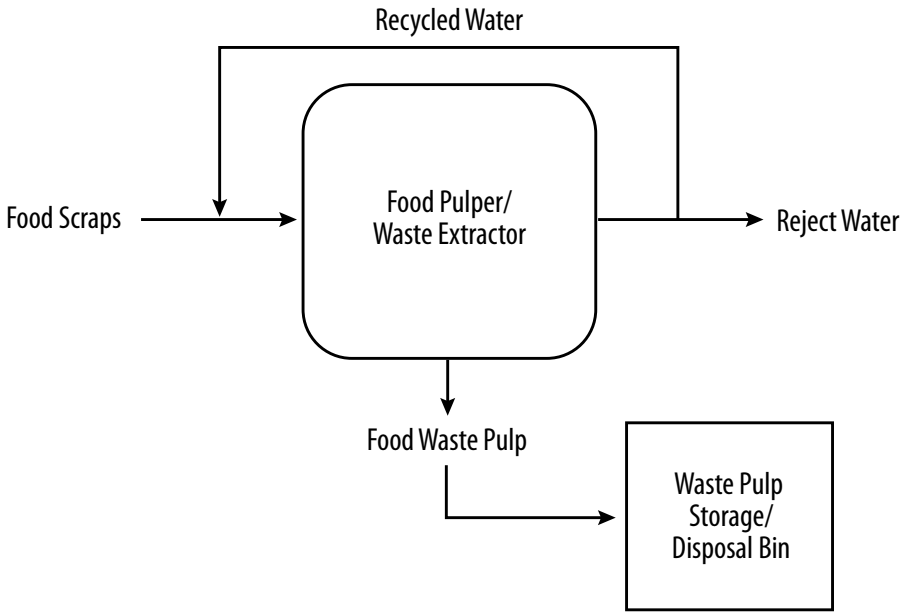
As an alternative to a traditional garbage disposal with a grinder, some facilities use food pulpers to collect and dispose of food scraps. Food pulpers are located where the grinder would otherwise be located. Unlike a traditional garbage disposal with a grinder, however, food pulpers crush food waste into a pulp (i.e., slurry), extract excess water from the pulp, then send the pulp waste to a bin for later disposal or composting. In many food pulper systems, the extracted water can be recycled within the food pulping process or reused to pre-rinse dishes or act as a sluice trough where food wastes are dumped. When a recirculation system is used, pulpers can recirculate 5.0 to 15.0 gpm through the system, needing only 2.0 gpm for make-up water.[51] Figure 4-6 illustrates the food pulping process.

Sluice trough

[50] Koeller and Company and H.W. (Bill) Hoffman & Associates, LLC. June 2010. *A Report on Potential Best Management Practices—Commercial Dishwashers.* Prepared for the California Urban Water Conservation Council. Pages 5-7. www.cuwcc.org/products/pbmp-reports.aspx.

[51] *Ibid.*

Figure 4-6. Food Pulper System Diagram



Food strainers are an alternative to traditional garbage disposals and food pulpers. As food scraps are rinsed from dishes, a scrap or strainer basket in the bottom of the sink captures the waste for later disposal or composting. Another type of combination system acts as both a food pulper and food strainer, recirculating water for pulping of food scraps and collecting food scraps in a strainer basket for later disposal.[52]

Before installing a new or replacing an existing food disposal system, consider any local restrictions on systems that discharge food waste to the sanitary sewer. Some areas have banned garbage disposals or have placed additional sewer charges on operations using them, due to concerns about increased loads on the local wastewater treatment plant.[53]

Operation, Maintenance, and User Education

For optimal food disposal efficiency, consider the following:

- Where possible, turn off the water to the food disposal system during idle periods when the system is not in use and when the facility is closed.
- Scrape larger food scraps into a trash receptacle prior to rinsing food waste into the food disposal system. Consider composting food waste if appropriate. See the U.S. Environmental Protection Agency's (EPA's) composting Web page[54] for more information.
- Do not pour grease into the food disposal system. Doing so can clog pipes over time.
- Do not place any hard objects into the food disposal system. This can dull the blades, reducing the unit's efficiency.

[52] *Ibid.*
[53] *Ibid.*
[54] U.S. Environmental Protection Agency (EPA). Composting of Organic Materials. www.epa.gov/osw/conserve/materials/organics/food/fd-compost.htm.

- Run cold water through the food disposal system instead of hot water. This will reduce the energy use associated with heating the water. It will also help to keep the system cool.
- Regularly inspect and clean the food disposal system to make sure the blades are sharp and the system is not clogged with debris.

Retrofit Options

To reduce the water use associated with a traditional garbage disposal, consider installing a device that can sense the disposal motor's load and regulate the amount of water necessary. These devices can reduce the idle flow rate when the garbage disposal is not in use, from between 2.0 and 15.0 gpm to 1.0 gpm, thus saving a significant amount of water. Also, consider installing a timer to stop the flow of water to the garbage disposal after 15 minutes, so that the user must periodically reactivate the system.[55]

Replacement Options

When purchasing a new food disposal system or looking to replace an existing food disposal system, consider these options:

- Purchase a garbage disposal with a load sensor to regulate the amount of water conveyed through the disposal depending upon whether it is in use or idling.
- Install a food pulper or food pulper/strainer combination system, which can recycle 75 percent of the water used for the food disposal process.
- Replace mechanical food disposal systems with food strainers, which use little to no water.

Savings Potential

Conventional garbage disposals can use a constant water flow of 2.0 to 15.0 gpm when in use. This water use can be significantly reduced either by retrofitting with a load sensor to regulate and reduce the amount of water used by the existing garbage disposal during idle mode, or by replacing the garbage disposal with a food pulper or food strainer. To estimate facility-specific water savings and payback, use the following information.

Conventional Garbage Disposal Retrofit

Water use can be reduced by retrofitting an existing conventional garbage disposal with a load sensor. Load sensors can reduce the flow rate through the garbage disposal to as little as 1.0 gpm when the garbage disposal is not in use (i.e., during idle periods). Water savings from the reduction in flow rate during idle use can be calculated.

[55] East Bay Municipal Utility District. 2008. *WaterSmart Guidebook—A Water-Use Efficiency Plan Review Guide for New Businesses.* Pages FOOD9-11. www.ebmud.com/for-customers/conservation-rebates-and-services/commercial/watersmart-guidebook.

Current Water Use

To estimate the current water use of an existing garbage disposal during idle periods, identify the following information and use Equation 4-18:

- Flow rate of water through the garbage disposal. This flow rate typically ranges from 2.0 to 15.0 gpm.
- Average daily idle period of the garbage disposal. Idle period is the time when the garbage disposal is turned on but not in use. While this will vary by facility, some estimates indicate that garbage disposals are typically used three hours per day. For a facility operating 12 hours a day, this would mean an idle period of nine hours if the garbage disposal is kept on throughout the day.[56]
- Days of facility operation per year.

Equation 4-18. Water Use of Garbage Disposal During Idle Periods (gallons per year)

= Flow Rate Through Garbage Disposal x Daily Idle Period x Days of Facility Operation

Where:

- Flow Rate Through Garbage Disposal (gallons per minute)
- Daily Idle Period (minutes per day)
- Days of Facility Operation (days per year)

Water Use After Retrofit

To estimate the water use from an existing garbage disposal that is retrofitted with a load sensor during idle period, use Equation 4-18, substituting the reduced idle flow rate. A load sensor can reduce the idle flow rate when the garbage disposal is not in use to as little as 1.0 gpm.

Water Savings

To calculate the water savings that can be achieved from retrofitting an existing conventional garbage disposal, identify the following and use Equation 4-19:

- Current water use as calculated using Equation 4-18.
- Water use after retrofit as calculated using Equation 4-18.

[56] *Ibid.*

Equation 4-19. Water Savings From Garbage Disposal Retrofit (gallons per year)

= Current Water Use of Garbage Disposal During Idle Periods – Water Use of Garbage Disposal During Idle Periods After Retrofit

Where:

- Current Water Use of Garbage Disposal During Idle Periods (gallons per year)
- Water Use of Garbage Disposal During Idle Periods After Retrofit (gallons per year)

Payback

To calculate the simple payback from the water savings associated with retrofitting an existing conventional garbage disposal with a load sensor, consider the equipment and installation cost of the retrofit load sensor, the water savings as calculated in Equation 4-19, and the facility-specific cost of water and wastewater.

Because garbage disposals may use hot water, a reduction in water use could also result in energy savings. Reducing the use time of the garbage disposal can also save energy. The potential energy savings may further reduce the payback period and increase the cost-effectiveness.

Conventional Garbage Disposal Replacement—Food Pulper

Conventional garbage disposals can be replaced with a food pulper. A food pulper can recycle and reuse 75 percent of the water used for the food disposal process, thus reducing the flow rate of fresh water required to run through the garbage disposal unit.

Current Water Use

To estimate the current water use of an existing garbage disposal, identify the following information and use Equation 4-20:

- Flow rate of water through the garbage disposal. This flow rate typically ranges from 2.0 to 15.0 gpm.
- Average daily use time of the garbage disposal.
- Days of facility operation per year.

Equation 4-20. Water Use of Garbage Disposal (gallons per year)

= Flow Rate Through Garbage Disposal x Daily Use Time x Days of Facility Operation

Where:

- Flow Rate Through Garbage Disposal (gallons per minute)
- Daily Use Time (minutes per day)
- Days of Facility Operation (days per year)

Water Use After Replacement

To estimate the water use of a replacement food pulper, use Equation 4-20, substituting the flow rate of fresh water through the food pulper. Freshwater flow rate through a food pulper that recirculates water for pre-rinsing is typically 2.0 gpm.[57]

Water Savings

To calculate the water savings that can be achieved from replacing an existing conventional garbage disposal with a food pulper, identify the following information and use Equation 4-21:

- Current water use as calculated using Equation 4-20.
- Water use after replacement as calculated using Equation 4-20.

Equation 4-21. Water Savings From Garbage Disposal Replacement (gallons per year)

= Current Water Use of Garbage Disposal – Water Use of Garbage Disposal After Replacement

Where:

- Current Water Use of Garbage Disposal (gallons per year)
- Water Use of Garbage Disposal After Replacement (gallons per year)

Payback

To calculate the simple payback from the water savings associated with replacing a garbage disposal with a food pulper, consider the equipment and installation cost of the food pulper, the water savings as calculated in Equation 4-21, and the facility-specific cost of water and wastewater.

Because garbage disposals can use hot water, a reduction in water use could also result in energy savings, which can further reduce the payback period and increase the cost-effectiveness.

[57] *Ibid.*

Conventional Garbage Disposal Replacement—Food Strainer

Conventional garbage disposals can be replaced with a food strainer. Because a food strainer does not use water for the grinding/food disposal process, installing a food strainer to replace an existing garbage disposal can eliminate this water use.

Current Water Use

To estimate the current water use of an existing garbage disposal, use Equation 4-20.

Water Use After Replacement

A food strainer can completely eliminate the use of water for the grinding/food disposal process.

Water Savings

To calculate the water savings that can be achieved from replacing an existing conventional garbage disposal with a food strainer, use Equation 4-21. In this case, water savings will be exactly equal to the current water use because the replacement food strainer uses no water.

Payback

To calculate the simple payback from the water savings associated with replacing a garbage disposal with a food strainer, consider the equipment and installation cost of the food strainer, the water savings as calculated in Equation 4-21, and the facility-specific cost of water and wastewater.

Because garbage disposals can use hot water, a reduction in water use could also result in energy savings. Eliminating the use of the garbage disposal may also save energy. The potential energy savings could further reduce the payback period and increase the cost-effectiveness.

Additional Resources

East Bay Municipal Utility District. 2008. *WaterSmart Guidebook—A Water-Use Efficiency Plan Review Guide for New Businesses*. Pages FOOD9-11. www.ebmud.com/for-customers/conservation-rebates-and-services/commercial/watersmart-guidebook.

Koeller and Company and H.W. (Bill) Hoffman & Associates, LLC. June 2010. *A Report on Potential Best Management Practices–Commercial Dishwashers*. Prepared for the California Urban Water Conservation Council. Pages 5-7. www.cuwcc.org/products/pbmp-reports.aspx.