EQUIPMENT waste reduction systems

WASTE REDUCTION SYSTEMS

TRADITIONALLY, A CERTAIN AMOUNT OF FOOD WASTE HAS BEEN A GIVEN. CAN THE RIGHT SYSTEM MAKE A DIFFERENCE?

BY PAUL KING

Since at least the 1970s, foodservice operators have sought ways to reduce the amount of waste they produce, and more importantly, the amount they dispose of in landfills. Their reasons include the rising cost of waste hauling, the decreasing number of landfills in the U.S., and a growing overall awareness and concern about the state of the environment.

Over the last five years, efforts to encourage—and, in some cases, force—foodservice establishments to reduce organic waste have been stepped up by government groups. Five states—California, Connecticut, Massachusetts, Rhode Island and Vermont—and three cities—Austin, Texas, New York and San Francisco—have enacted some form of ban on food waste in commercial landfills. The larger the foodservice operation, the more likely a ban is going to affect that facility.

The U.S. Department of Agriculture (USDA) and the Environmental Protection Agency (EPA) are trying to do their part, as well. In September 2015, the two government agencies jointly announced a goal of 50% reduction in food waste by 2030. For the past four years, the EPA has encouraged operations to reduce waste through its Food Waste Challenge. The program seeks out and rewards best practices in waste reduction and food recovery, providing information that can guide similar operators.

There are more ways than ever for restaurants and other foodservice units to donate leftover food to food banks, homeless shelters and the like, and legal guides have been written to help establishments do so safely. There are also software programs that can help operators identify and reduce the amount of leftover food they create in the first place.

But even with such programs and organizations, foodservice operators are always going to have some organic materials, such as peels, other scraps and unusable foods, that need to be thrown away. At this point, those who want to avoid using landfills have two choices: They can arrange to have materials hauled away for composting or reduction, or they can do it themselves. For operators with the size and the budget to do so, there are three ways to achieve the latter option: mechanical, or nonbiological; dry composting; or a wet system.

MECHANICAL

This nonbiological method, so-called because it doesn’t use any organic organisms in the breakdown process, has three types: pulpers, shredders and dehydrators. All are designed to reduce the waste’s bulk by as much as 90% by removing water.

Pulpers basically “puree” organic materials into a slurry from which water is mechanically extracted. Shredders grind
the waste and then press it down, forcing out water. Dehydrators use heat to dry out the waste, turning it into a sterile mass. Often, pulpers or shredders are used in conjunction with dehydrators.

There are several things to consider when choosing any of these processes. They are generally lower in cost than wet systems or composters. Unlike those, mechanical systems can accept nonorganic waste as well as food scraps. Although a water supply is needed for these systems to work properly, the water can be pumped back into the equipment and reused.

However, pulpers and shredders only reduce the volume of organic waste; they do not alter its composition in any way. As a result, the waste must be refrigerated until it is hauled away, to hold down odors and keep it from attracting vermin. This is why operators often opt for dehydrators, either alone or with a pulper or shredder. Dehydrators sterilize the waste and remove the odor. However, the resulting product is not compost and must be treated further before it can be used as fertilizer.

**DRIY COMPOSTING**

In-vessel composters take the natural process of decomposition and speed it up. Using a combination of mixing and aeration with the right temperatures and moisture, these machines can break down organic matter in as little as 24 hours or as long as two weeks, a window much shorter than traditional composting.

Composting vessels come in a variety of sizes, but all work basically the same. Organic matter is placed in the unit. A ventilation system circulates air to encourage oxygenation, which helps break down the waste. Sometimes, heat and microorganisms are used to kill bacteria, and brown matter such as wood chips or sawdust can be added to absorb excess moisture.

Some elements to consider in the implementation of in-vessel composters are the size of the units, the cost of purchasing and maintaining the system, and the fact that waste must be sorted (nonorganic items can’t be composted). Also, the resulting waste is not necessarily ready to be used as compost. Consultants recommend testing the waste to make sure pH levels are within the recommended levels, between 6 and 8.

**WET SYSTEM**

This type of system, also known as anaerobic biodigestion, uses water mixed with a combination of enzymes and microorganisms to break down the waste, much like the stomach digests food. The result is an effluent that, manufacturers say, can be safely dumped into municipal wastewater systems.

It is the most complex and expensive of the waste reduction systems, and uses a combination of mechanical and biological processes to achieve its goal. There are several systems on the market, each working in the same basic way. First, organic material is placed in the unit, ground down and moved to a processing vessel where it is stirred. Then, air and a proprietary mix of nutrients and enzymes—which may or may not include bacteria—are added to begin the breaking-down process, water is added, and the waste is given time to settle and decompose.

In addition to cost, size is a major consideration in choosing whether to use a wet system. The space required for one of these units can range from 6,200 cubic feet to more than 85,000 cubic feet. Water is another factor; some systems require hot and cold water, while others use only cold water. Another consideration is the type of food waste that can be treated. For example, some wet systems can handle bones and other hard materials such as seashells, while others cannot.

Most important is the fact that although manufacturers claim the resulting effluent can be dumped into municipal wastewater, studies have shown that this is not always the case. So, operators must validate makers’ claims before choosing such a system.

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**THE BOTTOM LINE**

Operators who decide to use a waste reduction system must weigh all the pros and cons before choosing the right equipment. The first step consultants recommend is a waste audit to understand a) how much waste is produced and b) what percentage of food waste can be collected and donated to food banks or other agencies.

Once you have determined the need for a waste reduction system, consider the following points:

- What will be the possible return on investment, based on waste-hauling costs and the electricity, water and sewer use of the system under consideration, its ongoing maintenance and staff time?
- How much physical space will be needed, and what will be the utility requirements of the system?
- How will the end product be used?

In the end, these factors should outweigh the cost and benefits of simply having waste hauled away by an outside entity that will do the job of converting the waste.