New Tools For Tackling FOOD WASTE

Landfills are filling up, and jurisdictions from sea to shining sea are looking to divert food waste. We look at two new types of systems getting traction in the U.S.

Baptist Health, a 383-bed hospital in Lexington, Ky., purchased two Somat DH-100 dehydrators when it renovated its foodservice in early 2013. Food-facility consultant Stan Schwartz, PFDAI, Cleveland, situated them in a loading-dock area. They reduce organic waste volume by 93%.
being pursued by hundreds of U.S. chains, not just the big QSRs."

But Ashton and Muldowney also see one other important driver of faster growth for E&S next year. "The spec markets finally appear to be recovering," Ashton says. Reps' quotation trends and foodservice-consultant activity have reached levels not seen since before the recession, according to data from the MAFSI Business Barometer. State and local tax receipts and budgets have improved, helping the publicly funded segments. Point-up demand in these segments is pronounced, Ashton says.

"We'll be very surprised if E&S doesn't see as much as a point or more of faster growth in 2014," Ashton says. "Though remember, we've been surprised before."

### FER E&S Manufacturers' Sales* & Forecasts, '12-'14

<table>
<thead>
<tr>
<th>Category</th>
<th>2012 $S Millions</th>
<th>2013 $S Millions</th>
<th>2014 $S Millions</th>
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<td></td>
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</table>

Equipment and supplies posted the slowest post-recovery sales growth in the first quarter 2013. Growth since has been surprisingly strong, but FER will await fourth-quarter results before revising its 2013 or 2014 forecasts from July. Stronger growth is forecast in '14.

*Note on the numbers: We base our forecasts on market-size numbers from the North American Association of Food Equipment Manufacturers "Size & Shape of the Industry" biennial studies. The base year is 2011. All dollar numbers since 2011 are FER forecasts. Comparisons cannot be made to previously published market-size estimates. For information on purchasing the "Size & Shape" study, which details market-size estimates for more than 600 E&S categories, go to ndemong.org or call 312/621-0201."

If you could wave a magic wand and get rid of your organic waste, no doubt you'd brandish it fiercely. At anywhere from about $60 to more than $150 per dumpster pickup—plus any weight charges—it's expensive. It requires labor. It's a health and safety issue.

A growing number of jurisdictions are starting to restrict or ban some of the usual handling techniques. Some municipalities are edgy about how you use disposers and standalone pulpers, and some jurisdictions are moving toward restricting or banning food waste going to landfills. The trend is especially strong in the Northeast, such as in Connecticut and Vermont; effective July 1, Massachusetts is banning any entity that produces more than a ton per week of organic waste from sending it to the landfill. The affected group includes supermarkets, healthcare, colleges/universities, large schools, businesses, large restaurants, etc. California is studying similar limitations. New York City is imposing restrictions. The trend is pretty clear—so for many of you, the question isn't whether you're going to change how you handle organic waste—it's how and when.

Two Main Types, Several Suppliers
Composting long has been—and continues to be—an option in many areas. It reduces waste going to landfills, but it's still a haul issue for all but the largest institutions; additionally, composting facilities aren't available everywhere. Several technologies that reduce waste at the source have emerged over the past few years, and two in particular are gaining in the foodservice sector: food-waste dehydrators and "wet" biodigesters.

These two categories are only about five years old in North America, and the list of suppliers still is in flux with various names coming and going.
Many are from Asia, South Korea in particular. Some are made here in the U.S. as well as Australia. As we gathered information for this article, the current lineup for dehydrators included a well-known name in foodservice, Somat, plus other brands that are lesser known in foodservice circles, such as GaiaRecycle and Hungry Giant. EcoVim USA, which has a fair number of units in the field, appears only to have an active distributor for parts and maintenance support.

On the wet biodigester side, suppliers include EnviroPure Systems, owned by T&S Brass, as well as BioHitech America, Green Key Environmental Solutions, Totally Green/ORCA and Power Knot.

Dehydrators, as their name indicates, remove water content from food waste. Dehydration uses heat and churning to remove about 60-90% of weight and volume, leaving a dry, sterile, odorless biomass that is “suitable for use as compost feedstock, and—after testing—in some instances may be used directly as a soil amendment,” according to a study by Northeastern University for the Massachusetts Department of Environmental Protection.*

Wet biodigesters accelerate natural decomposition. Some introduce microbes and/or enzymes to speed up the breakdown; others don’t use additives but instead use micronutrients to accelerate the action of bacteria that occur naturally in food waste. Both types add incoming water to accelerate the process. As the food disintegrates and liquifies, it passes through filters or screens into the sewer system. Generally, nothing is left to haul away.

Each category has its pros and cons; as you go forward, you’ll be doing the usual economic math plus weighing environmental and regulatory priorities from area to area.

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**Systems For Your Size**

Before you start sorting through your options, you need to decide if any of them will make economic sense for you. Capital costs run all over the board, partly because these systems can be customized considerably and come in a number of capacities. Ballpark costs are $22,000-$50,000 and higher. A wet biodigester will have a lower capital cost than a dehydrator.

Like most technologies, larger applications are more cost effective at first, then smaller versions come into play. Most end users of either system type have been larger operations—supermarkets, casinos, hotels, colleges/universities, hospitals/healthcare facilities, etc.—and their systems can process as much as 2,000 lb./day or more. But smaller models are suitable for midsize, fairly busy restaurants. These units come in capacities as low as 110-220 lb. per batch; typical cycle times for a full 220-lb. batch are 12-18 hours for standard content. If your waste tends to be wetter or drier, your cycle times will be higher or lower, respectively.

You’d have to run the numbers, but if payback is a deciding factor, midsize restaurants and larger operations generally can find a system with a payback of 24 months, maybe less.
Dehydrators & Electricity

So if you’re in the market, how do you sort your options? First, consider the operating differences between dehydrators and biodigesters. There are more than a few.

First, dehydrators. You load your food waste—pulped, shredded or ground—is recommended to speed the dehydration process—into the unit and close the door. It’s pretty straightforward. Dehydrators do not require incoming water. They use a heater, blower and paddle-agitating system to stir the food waste and evaporate the moisture. Typically they heat to about 180°F, and cycle times generally run 12-18 hours as mentioned previously, although those times can vary depending on content. Also, some models are faster than others, so this is a detail you’ll want to check. Every menu and operation will be a little different.

At the end of a cycle, evaporated moisture has condensed and gone down the drain. What remains is about 10-15% of the original volume and weight, a product the consistency of sawdust or coffee grounds that you can toss in the dumpster, divert for composting and/or use as a soil amendment.

Incremental water costs are zero. The system does not use incoming water, and unless your sewer load is metered, the water dehydrated from the food waste is a non-issue. (Plus, the water is potable, so the sanitation system does not experience any additional load.)

The energy needed for this size and type of system is 3-4kW, depending on the model. For estimating purposes, a cycle time of 18-24 hours and an average rate of 10-11 cents per kW works out to about $6-$7 for a 200-250-lb. batch. Compare that with what 200-250 lb. would have cost you if it went straight into your dumpster for hauling. With a dehydrator, you still have to pay to get rid of the remaining biomass, but it’s a tenth of the volume and weight.

As for operational considerations, the only issue that might come up is overcrowding. Once a dehydrator cycle begins, you really need to allow it to finish. So if you have new waste coming in, you’ll need to be able to store it somewhere until the next batch cycle begins.

Biodigesters & Supplies

Wet biodigesters have a different checklist. First, they’re not batch systems. They run when they are on, and the process is continual. You can open the door and add new food waste as it arrives. When the waste is fully processed, there’s nothing—or nearly nothing—left to haul or divert.

Where dehydrators use electricity, biodigesters use water. Water consumption varies from model to model, but the Northeastern University study says you can figure “1 gal. of fresh water is pumped in for every 4 lb. of food added to the system at the low end [of the consumption scale], with approximately 2 gal. of effluent discharged. On the higher end of the scale, about 1 gal. is pumped in for every 1 lb. of food waste.” You’ll want to figure in the cost of the additional water consumption as well as the sewer charges, which often tend to be two to four times the water charge, depending on your locale.

If you choose a system that requires heated water, include heating energy in your calculations.

With biodigesters, the consumable substances come into play as well. If you use an environmentally simpler (non-enzyme) system like EnviroPure’s, you’ll need to replenish the nutrient/medium material from time to time.

If you use an enzyme system, you’ll need to replenish the enzymes periodically.

Downstream

All of this information gives rise to a couple of environmental questions. These technologies are so new in the U.S. that good, solid environmental information is hard to
come by. There are so few systems in the field that most water utilities really have not looked into them yet, as BioCycle magazine notes in its October 2013 issue. But some water authorities are wary about enzyme systems.

The BioCycle article, “Analysis of Biodigesters And Dehydrators To Manage Organics On-Site,” reports: “Specifically, the authorities responsible for a city or town’s sewer system want to prevent wastewater with excessive levels of biochemical oxygen demand (BOD). When BOD is too high, the microorganisms that decompose the pollution use too much of the oxygen, depriving other aquatic life.”

The article notes another concern about enzyme systems, saying one wastewater enforcement officer expressed concern that they may only “break down the waste temporarily, with much of the FOG congealing again downstream.”

To date, we don’t know of any test data confirming these concerns, and they may not be founded. But the water industry is beginning to study such issues, which means regulations on enzyme systems may be in flux. Make sure you have the latest information before you buy.

*On-Site Systems for Processing Food Waste, A Report to the Massachusetts Department of Environmental Protection, Isaac Griffth-Ono, Zak Puttan and Jennifer Wong, Northeastern University, 4/26/2013.

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**BIOHITECH AMERICA ECO-SAFE DIGESTER**

Three models of the Eco-Safe Digester are available to digest 800-2,500 lb. of virtually any kind of food waste—vegetables, fruits, meat, fish, poultry, grains, coffee grounds, egg shells and dairy products—within 24 hr. The system uses a proprietary blend of microorganisms and wood chips, which load into the digester. Agitation and water help digest the food waste into a liquefied grey water that drains into a conventional sewer system. The waste then is transported to wastewater-treatment plants where it is further digested. Food waste can be added continuously throughout the day. Smallest unit measures 43-in.W x 36-in.D x 48-in.H.

[biohitech.com](http://biohitech.com)

**ENVIROPURE/T&S BRASS DECOMPOSITION UNIT**

EnviroPure offers on-site accelerated decomposition of 120-1,400 lb. of organic food waste including meat, bones, vegetables, shells, pits and coffee grounds typically within 24 hr. Through a natural process that uses no enzymes, food is converted into grey-water effluent that is streamed safely into municipal systems. The system creates no odors or sludge buildup and can cut traditional waste-elimination costs by 50%. The technology maintains optimal temperatures and oxygen levels necessary to hyper-accelerate the natural aerobic decomposition process. The all-natural EP-BioMix formulation provides the bacteria present in food with critical nutrients required for rapid breakdown. The result is total elimination of food waste. General footprint sizes range from 34-in.W x 42-in.D x 60-in.H to 110-in.W x 120-in.D x 110-in.H, but units each are configured to suit custom space and/or design constraints.

[enviropuresystems.com](http://enviropuresystems.com)
**GAIA RECYCLE SYSTEMS DEHYDRATOR**

GaiaRecycle Systems employ patented technology to process mixed food scraps and other organic waste into a sterilized, easy-to-handle, dehydrated output material while reducing waste volume and weight by up to 90% in an 8-11-hr. processing cycle. Available models can process 66 lb.-2 tons a day. No microorganisms, enzymes, fresh water or other additives are required. With more than 40 registered and applied patents, including a double-helix shredder and blade design, the units accelerate the reduction process. Advanced built-in sensors monitor waste temperatures and automatically shut off the unit at process end. Operation is automatic, providing a hassle-free user experience.

gaiarecycle.com

**GREEN KEY BIODIGESTER**

The Green Key Biodigester uses Bio Star and Green Pro additives to break down food waste and consume the odors the process produces. Bio Star is a combination of 17 different types of microorganisms that can eliminate food waste in fewer than 24 hr. Green Pro is a ready-to-use liquid bacterial formulation specifically designed to digest difficult compounds, such as paper, food waste, oil and grease. With 5 different machine sizes, Green Key can handle almost any amount of waste from 100-2,000 lb. a day.

green-key.net

**HUNGRY GIANT RECYCLING DEHYDRATOR**

Hungry Giant dehydrating food-waste machines are designed with a proprietary heating/cooling technology to process mixed-food waste quickly and reduce weight and volume by up to 93%. Six models are available to process 242-5,900 lb. a day in footprints ranging from 42-in.W x 32-in.D x 43-in.H to 121-in.W x 68-in.D x 113-in.H. The unit dehydrates with heat delivered through an air-fan assembly, but engineers also made a proprietary improvement to include a liquid-coolant system that converts steam into sterile condensate much faster than air-cooled-only dehydrators. This enables the machine to process up to 50% more food waste per day than most competitors, according to the company, which translates to lower electrical costs and a better ROI. List prices range from $19,900-$398,000.

hungrygiantrecycling.com
TOTALLY GREEN ORGANIC DIGESTER
Totally Green’s ORCA system offers an environmentally friendly organic-food-waste disposal solution allowing customers to dispose of organics at the source, eliminating the need to truck the waste to landfills or remote composting facilities. Natural and safe microorganisms combined with the action of the ORCA machine technology converts organic waste into earth-friendly water within just 24 hr. Liquid effluent exits the ORCA machine through a fine screen, runs directly into the drain and is treated at the wastewater treatment facility. The ORCA solution can divert up to 600, 1,200 or 2,400 lb. a day, depending on food composition and model size. Model dimensions range between 48½-in.W x 33½-in.D x 48½-in.H and 115½-in.W x 33½-in.D x 48-in.H.
feedtheorca.com

POWER KNOT LIQUID FOOD COMPOSTER
The Liquid Food Composter uses a series of processes in which microorganisms break down biodegradable materials in the presence of oxygen. The unit uses a proprietary mix of microbes and enzymes to accelerate the digestion of most food products and bio-plastics within 24 hr. The final output is grey water. Operators can add food waste at any time and only composted food discharges into the wastewater. The machine uses 30-230 gal. of water a day (note: a single person’s typical daily water consumption is about 80-100 gal. per day), depending on the model. A churning arm continually mixes old food, new food, oxygen and microorganisms. Six models handle 110-2,000 lb. of waste per day in sizes from 38-in.W x 29-in.D x 38-in.H to 69-in.W x 48-in.D x 61-in.H.
powerknot.com

SOMAT DH-100 DEHYDRATOR
The DH-100 food-waste dehydrator is designed for use in medium- to large-scale restaurants, fast-food franchises and supermarkets as well as medium-size food-preparation facilities in schools and cafeterias. It can process 110,220-lb. input load of food waste. The system does not require any special installation, hookups or ventilation. No enzymes or additives are required. Simply connect to the electrical outlet, and the system is ready to operate. The one-touch control is fully automatic, sensing the status and providing feedback and control of the operation without pre-setting the timer. The unit, which measures 45-in.W x 37½-in.D x 44½-in.H, reduces volume up to 93%. The system also recycles the heat energy, reducing overall energy consumption. The dehydration processing time will vary depending on the waste input but will average 12-18 hr. and take no longer than 24 hr.
somatcompany.com
Operator Markets Slowly Improve

Despite government shutdowns and tax hikes, operator prospects look brighter in 2014.

Foodservice operators had a surprisingly good year in 2013. Yes, growth slowed to 3% in current dollars, down from 4% in 2012, according to Technomic Inc. The forecast for '13 real growth is now 1% vs. 1.9% the year before. That was the best year for foodservice-operator sales since 2007.

But 2013 could have been so much worse. First there was the “fiscal cliff” standoff at the end of '12. Then the payroll-tax holiday—a 2% reduction put in place during the depths of the Great Recession—expired, taking hundreds of dollars per household from consumers’ pockets. Then gas prices atypically spiked in January and the federal budget sequester kicked in. Operators got socked with big snows and cold in January and February, in comparison with an unusually mild winter the year before. And everyone was afraid food prices would soar, as the drought of 2012 led to spiking prices for animal feedstocks.

So the market tanked, right? Well, not exactly. The first quarter was the toughest of the year with flat traffic and shrinking same-store sales, but things popped back nicely in the second quarter and held most of the gains in the third. Preliminary eating-

NRA's Performance Index Holds Up

The NRA's Restaurant Performance remained in expansion territory throughout 2013 and rose in spite of the government budget and debt fight in October. Operators' confidence about the next six months also improved in the October survey.

Source: National Restaurant Association. Values greater than 100 signify expansion; below 100 signify contraction.

Technomonic Forecasts Fourth Year Of Real-Sales Growth

After three years of unprecedented real sales declines during the Great Recession, operator sales have remained moderately positive since 2011.

Source: Technomic Inc.
THEY CAN FORGIVE AN OVERCOOKED STEAK,

BUT NEVER A DIRTY PLATE.

Research shows that consumers will forgive bad food faster than dirty dishes. That won't be an issue if you have a Champion in your dishroom. Our exclusive dual rinse technology provides double the sanitation and offers a quieter, cooler dishroom through insulated, hinged doors. This keeps the heat where you want it and offers easier access to the clean you need. Regardless of the size of your operation, problems in the dishroom, or the number of covers per day...

We can take that off your plate.
Chain Same-Store Sales Trends Are Mixed

Quick-service chain same-store sales have rebounded since the first quarter of 2013, while full-service chains have posted mixed results. McDonald’s results trailed the quickservice average through 2013.

Source: Technomic Inc.

Technomic Operator Sales On The Rise

<table>
<thead>
<tr>
<th>Operator Sales &amp; Units By Segment</th>
<th>’13 Sales* ($ Billions)</th>
<th>% Real Growth ’13**</th>
<th>% Real Growth ’14**</th>
<th>’13 Unils &amp; Contact Points</th>
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<tr>
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Foodservice operator sales showed somewhat in 2013 vs. 2012 as payroll tax hikes and government budget cuts held back consumer spending and government support of publicly funded noncommercial segments. But Technomic forecasts sales will increase moderately in 2014 with growth across nearly all segments.

Source: Technomic Inc. *Sales include food, alcohol and non-alcoholic beverages and non-food, Data not comparable to previous forecasts because of the inclusion of alcoholic and nonfoods, as well as refinements and resegmentation. **Real growth figures assume an inflation rate of 2% for 2013 and 2.5% for 2014. School, military and corrections segments use 1% vs inflation rate.

Somewhat Stronger Growth Forecast For 2013

So what’s the outlook for 2014? Modestly better. All of the key macroeconomic drivers of foodservice are expected to improve in 2014. Blue Chip Economic Indicators forecasts real disposable personal income will grow by 2.5% in ’14, a nearly two-point improvement over ’13. Employment trends finally look more positive. Gas- and food-price increases are forecast to be moderate. While lower-income households were a bit more fearful after the government shutdown, the mood of wealthier Americans, who buy the most foodservice, is upbeat thanks to record equities market prices.

Technomic’s latest forecast for total foodservice, revised last August, calls for 3.8% nominal growth, with real growth of 1.3%. Menu-price inflation and drinking-place sales data from the U.S. Department of Commerce show restaurant sales hit a record in October, in spite of the government shutdown and debt-ceiling fight.

The threatened food-price spikes never really materialized, though wholesale food prices are running about half a point ahead of the gain in ’12. Gasoline prices moderated over the spring and fall nearly all fall. While consumer confidence has declined since the government shutdown (and that might undercut foodservice sales somewhat in the fourth quarter), what is apparent as we write this in late November is how well foodservice did in spite of all of the challenges.
is predicted to increase only slightly to 2.5% in ’14 from 2% in ’13. On the restaurant side, The NPD Group is looking at a 1% increase in traffic next year, after a year of little or no gains in visits in ’13. While the National Restaurant Association forecast for 2014 was scheduled to be released in mid-December, before we went to press, the group’s Senior V.P. of Research, Hudson Riehle told FER he expects the industry to post another year of positive growth in ’14.

“With regard to foodservice in 2014, we don’t expect any watershed moments,” Joe Pawlak, v.p. at Technomic, wrote to FER. “The industry is expected to continue its path of slow growth, as it has seen over the past two to three years.”

NPD’s Restaurant Analyst Bonnie Riggs sounded a similar note. “While consumers’ mindset for cautious, controlled spending is expected to remain in place for some time, NPD’s forecast of traffic and dollar growth for 2014 shows improved performance compared to 2013.” The group is forecasting a 2% gain in consumer spending on restaurants, which, with the forecast traffic increase, would add up to 3% growth.

Among the segments expected to drive growth in 2014 are fast-casual chains, sub-sandwich shops, gourmet coffee and donut concepts, supermarkets and healthcare foodservice. Technomic earlier reported that fast-casual concepts now account for 8% of all restaurant sales, up from only 2% five years ago.

Riehle expects more operators to incorporate new technologies into their restaurants. He notes that nearly two-thirds of consumers recently have used technology, such as smart phones or tablets, to order takeout.

“When it comes to what consumers will order with that new technology, locally sourced items, environmental sustainability and healthful kids’ meals will continue to be the top menu trends for the year,” Riehle said.

For those who sell equipment and supplies, a better year for operators should translate into a better year for the E&S market, too.

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