



Taking a bite out of organic waste

Reducing a health care facility's ecological footprint can happen in many ways; improved energy management practices, decreased water consumption, elimination of toxic-containing products used in diagnostic, treatment and cleaning protocols, and how organic waste is managed.

Diverting and treating organic waste within health care facilities varies widely across Canada due to a number of reasons including availability of funds to adequately develop and administer an organics programme, the organisation's level of commitment to environmental sustainability, diversion options available from the local city/municipality, and the capabilities of local waste haulers and receiving locations to properly handle source-separated materials.

In addition, making meaningful comparisons and developing benchmarks between health care facilities is extremely challenging as the Ontario Hospital Association notes in its 2012 Green Hospital Champion Fund: Opportunities to Green Ontario's Hospitals report: "Ontario hospitals are challenged by the absence of a universally-accepted waste audit standard, resulting in poor comparison between hospitals and low assurance of the effectiveness of project-specific diversion claims."



What is organic waste?

Organic waste, sometimes referred to as biodegradable waste, is waste that typically originates from animal or plant sources, and is routinely broken down by other living organisms. This may include, but is not limited to food waste (cooked and uncooked), garden and lawn waste, and may include paper/waxed food packaging containers, napkins, incontinence/hygiene pads, sewer waste, and some types of animal bedding. (See Table 1)

Organic Waste

Cakes, cookies and candies
Fruits
Vegetables
Meat and poultry
Dairy products
Pasta, bread, rice and cereals
Fish and seafood
Bones
Eggshells, rice beans and cheese
Popcorn bags
Waxed cardboard products (take-away food containers)
Garden waste
Lawn clippings and leaves
Napkins, paper towels and paper plates
Animal waste (including some types of bedding)
Frozen food boxes (pizza, TV dinner)
Milk and drink cartons
Coffee grounds, filters and tea bags
Ice cream containers
Sugar and flour bags
Parchment and waxed papers
Plants, flowers and soil
Animal waste, bedding and cat litter
Incontinence pads, diapers and sanitary products

NOTE: ALL organics programmes are not created equal so remember acceptance of the above items, including unsoiled paper products, varies depending upon the jurisdiction and carrier involved.

Table 1

The Natural Process

Composting organic matter is nothing new and has been going on around us naturally for centuries. However, by discarding organic waste into plastic bags for disposal in dump sites, we disrupt the natural process. Properly composting organic waste, and keeping it out of landfill, is beneficial to the environment in that it reduces the propensity for bacteria, disease and vermin (which may spread bacteria and disease) in waste sites, and helps prevent the associated generation and release of methane gas (CH₄)* into the environment; a gas that is 21 times more potent than CO₂ in terms of its global warming potential.

*Environment Canada reports emissions from Canadian landfills account for 20% of national methane emissions.

The size of the problem

Based upon preliminary findings from the 2012 Ontario Hospital Association (OHA) study due for official release mid-2013, approximately 17% of the hospital waste stream is organic waste and on average, the disposal cost in Ontario's hospitals is \$96 per tonne. That makes the estimated annual cost for disposal of organic wastes in Ontario, approximately one million dollars.

In Ontario, only 2% of organic wastes from hospitals is currently recycled or composted. Organic diversion was found to be virtually non-existent outside of central and southern Ontario where only 6.8% and 5.3% of their waste stream is collected for organics processing.

Due to their location, waste disposal fees for some northern and small rural facilities are charged on a "per visit" basis as opposed to per tonne, therefore contributing to even higher effective per tonne costs in these areas.

If we assume Ontario makes up 30% of the national value, then we can speculate that Canada's total quantity of organic waste is an estimated 38,000 tonnes/year. While waste disposal costs vary across the county, a projected cost to dispose of organic waste is approximately \$3.6 million per year.

Considering these numbers in a national context, this represents but a miniscule portion of the potential that exists across Canada to divert organics from landfill, turn it into a resource for gardens, farms and parkland, and save the health services sector tens of millions of dollars in landfill and transportation costs.

Large-scale organics processing facilities are not available in all locals so forward thinking health care organisations are doing the next best thing: thinking locally, by investigating technologies that will help them better manage their organics, and by developing in-house composting initiatives. In many cases, the most environmentally-friendly solution has resulted in net-zero additional cost.



Returned patient trays often include fish and meat products, cheeses, vegetables and fruit plus bread and other grain products, easily composted by a variety of methods.

What to do?

Unfortunately dealing with organics in a health care institutional setting isn't as easy as dumping it all into the little green composter in the backyard. The volume of organic waste generated by many of these sites can well rival that generated by a large village and must be treated with both financial and environmental competence.

What you do and how you do it will be dictated by a number of factors including space limitations within your facility, executive and managerial support, financial capacity, local by-laws, capacity and capabilities of your waste hauler(s), and the local infrastructure's ability to accept and process waste.

It is not uncommon for a health care organisation to subscribe to multiple methods of dealing with its organic waste, depending upon the size and nature of their facilities. One building or department may employ a sink-based waste disposal unit or pulper before sending the waste to the sewer system while another location may simply collect all organics in large bins and ship them via third-party carrier to landfill or a composting station.

Others may compost on-site, either through use of compost technology or natural means outdoors, or dehydrate their waste and then ship off-site for further processing into soil amendment or compost.

Composting

Let's put aside the idea of simply discarding all your organic waste in garbage bins and sending it to landfill. This approach is both environmentally unsound and expensive. There are other options.

Considered donating pre-consumer food scraps to a local farmer as animal food for example if local laws permit.

On-site, open-air backyard composting is perhaps the cheapest of all organic waste-handling approaches but will probably be frowned upon by your infection control practitioners as it is prone to attracting insects and vermin, the potential spread of bacteria, and could become a source of very unpleasant odour. There may also be local/provincial/territorial regulations to be met for siting requirements and quality of compost generated. On the positive side, however, is the free soil nutrients you will generate for your on-site flower and vegetable gardens.

Off-site composting will increase both your ecological footprint and your transportation costs, but is considered a sound environmental alternative that will help reduce the amount of methane gas otherwise produced in landfill sites and provide a marketable end product for use in gardens and landscaping.

Vermiculture is a way accelerating the natural composting process using various types of earthworms including red wigglers and white worms. The resulting compost is a mix of vegetable and food waste, bedding material and



Vermiculture is an alternative organic waste processing method that uses earthworms to accelerate natural composting.

vermicast, also known as worm castings or worm manure. It is usually very high in nutrients.

Upon further investigation, you may find it practical to commence a vermiculture initiative to deal with your organic waste. Vermiculture systems are often capable of handling vegetable and fruit waste including peelings and “high acid” citrus foods, coffee grounds and filters, tea bags, crackers, cereals, breads and grains, eggshells, and grass clippings and other yard waste.

Sink-based waste disposal units, sometimes referred to by the names “garburator” or “Insinkerator,” shred or grind food waste ‘put down the sink,’ typically by using a steel cutting mechanism. With the addition of water, the food waste is flushed down the drain and into the sewage system. Many jurisdictions have by-laws preventing the use of such disposal units so be sure you check local standards before committing to this type of food waste processor which requires both water and electricity to operate. It has been suggested, that due to the increased levels of organic matter in the service lines, some organic matter may stick in the lines and over time create blockages, as well as cause increased strain on the sanitary sewer system.

Pulpers or “macerators” as they are often called, reduce the volume of organic food waste through various methods of grinding and de-watering. Flushing mechanisms are often employed to keep the food waste moving efficiently through the system. Some manufacturers are opting for a closed-loop design that reuses water which helps to lower water and sewer charges. The resultant ‘pulp’ can then be disposed of in a variety of ways including taken as feed stock for composting or sent to landfill, which we discourage. In addition to food waste, some units are also capable of pulping plastic utensils and disposable food containers, drink cartons and beverage cups, tinfoil and other common food service items, thereby reducing volume and weight of waste for further handling by your waste disposal company.

Organic Waste Management Options Hierarchy

Action Hierarchy	Waste Management Option	Pros	Cons
Reduction	Allow patients to select from menu of options to reduce waste.	Reducing the volume of food if patients can't eat that much. Individual selections of food types will ensure personal tastes are met. Improved nutrient state of patients Reduction in landfill costs.	Requires changes in Food and Nutrition delivery.
Patient food waste can reach as much as 60%			
	Promote healthy fresh choices in cafeteria and patient care to improve quality of food.	The tastier the food the more will be eaten with improved nutrient state of patients. Reduction in landfill costs.	Requires changes in Food and Nutrition delivery.
	Using hand blowers rather than paper towels can reduce soiled paper waste from bathrooms.	Highly energy efficient hand blowers have been cost effective replacements for purchase of paper towels.	Requires changes in washroom infrastructure. Increases energy use.
Reuse	Food preparation wastes (pre-consumer) sent to hog farmers or other agricultural use. Regulations in some jurisdictions may prevent this because of health and safety concerns.	Reuse of nutrition to animals. Reduced landfill costs.	Need relationship with local farmer. Need to ensure pick-up off food waste on a timely basis. Need to ensure storage of food waste adequate before pick-up.
	Freeze on-site or donate unused prepared meals (before they get to the patients) to food banks, homeless shelters and similar community-based organisations.	Reuse of nutrition to humans. Reduced landfill costs.	Need to establish infrastructure requirements (i.e. freezers) or relationships with community organizations.
Composting on-site	Food wastes to on-site composter / vermicomposter with use of compost materials on-site.	Reduction of landfill costs. Use of compost materials can provide nutrients for on-site gardens.	Capital costs of on-site unit. Need space to locate on-site unit. Possible regulations. Need to maintain composter.
	Organic wastes from outside maintenance to on-site composter with use of compost on-site.	Reduction of landfill costs. Use of compost materials can provide nutrients for on-site gardens.	Capital costs of on-site unit. Need space to locate on-site unit. Need to maintain composter.
Composting Offsite	Food waste picked up in separate containers and sent for composting offsite.	Coordinate with existing municipal composting facilities.	Need additional bins for organic waste collection. May have to pay fee for transport and composting.
Other Waste Management Options	on-site organic waste dehydrators.	Reduces volume of organic waste by up to 90% and therefore haulage costs.	Increased energy costs. Need to dispose of dehydrated organic wastes (on-site or offsite to compost). Need designated space to site unit inside. Need liquid waste drainage hook-up to unit.
	Insinkers / garburator.	Reduces organic waste and therefore haulage costs. No significant space requirements of new equipment. Low capital costs.	Disposal of nutrients into sewer system may be problematic with municipal wastewater management system. Cannot reuse nutrients.

You have options.

Looking for ideas on how to handle the organic waste being generated in your health care facility? The chart at left contains some ideas to help you begin the discussion. Remember to consult your city or municipal waste management department and your waste hauler(s) for additional ideas and assistance.

“The best way to achieve success with a new initiative like this is by talking to the people who are going to use it, and listening to their feedback. The chance to be heard is a powerful sedative for contrarians.”

Dr. Curtis Lavoie
The Children's Hospital of Eastern Ontario



Approximately 30% of household garbage is organic material that when properly processed can form compost for use in gardens, farms, and parklands. Similarly, the organic waste in your health care facility is a wealth of riches when properly redirected within your waste stream.



Soil amendment and compost resulting from on-site handling of organic waste can be put to good use in vegetable and flower gardens such as shown above at the Hôpital Glengarry Memorial Hospital in Alexandria, Ontario.

On-site dehydration technology also holds promise for some sites where upwards to 90 percent of the weight of the organic waste can be reduced by using machines that employ various mechanical and thermal processes. This typically involves heating and systematically mixing the organic waste until a relatively dry, volume-reduced by-product is produced.

The resultant ‘soil amendment’ can often be blended or otherwise treated to form compost suitable for gardens and landscaping purposes.* While these units do require electricity to operate, there may be a concomitant decrease in disposal costs due to weight reduction of the initial organics and reduction in frequency of waste pick-up. You will need to do the math on this yourself. Ensure that any resultant water effluent (by-product) meets standards for safe municipal sewer system disposal.

Consider also on-site composting vessels, if you are looking to generate (food)-pathogen-free compost for your own use or sale and use by others. By their nature, these closed-container systems accelerate the natural composting process through heat, mechanical and biological actions. Many such systems can accommodate fish, meats, fruits, and vegetables, whether cooked or uncooked, lawn and garden waste, and waste from animal including some types of animal bedding. Some produce micro-organism- and nutrient-rich compost within as little as ten to fifteen days and may require the addition of organic matter or bulking agents, or enzymes to effectively manage the process.

Advice

When considering the development and launch of an organics composting programme, be sure to include costs and logistics related to the need for renovations to accommodate any new equipment or bins that may be required.

Ensure you have an accurate audit of your organic waste completed by a competent auditor and don’t be afraid to look at all potential options, no matter how odd they may strike you. This is definitely time to think outside the organic waste box.

It’s often smart to test your organics plan in one area first, such as the cafeteria, then expand it to include patient food, and other areas such as catering/corporate and retail. This will allow you time to evaluate your programme bit by bit and make necessary changes before you roll it out to full capacity.

Consider also your organic disposable food wares (unless you use all reusables), which can add up to a very significant volume in some cases, and ensure they can be properly handled under the new organics plan.

You may also face the issue of how to deal with polystyrene foam, such as found in disposable coffee and drink containers, clamshell food containers, and serving plates. Perhaps you know these products by their trademarked name “Styrofoam,” owned and manufactured by the Dow Chemical Company. Some waste carriers may permit the comingling of this foam with organics but be sure you investigate fully during the research phase of your organics programme development.

Properly plan your waste bin/tote storage area to avoid

* See compost quality standards at:
www.ccme.ca/assets/pdfcompostgdlns_1340_e.pdf

having the food waste freeze in the containers when exposed to harsh winter temperatures. Bins/totes are heavy so also ensure a snow- and ice-free transit path immediately outside the holding area doors.

Some waste-handling technologies may be ENERGY STAR qualified so be sure you ask your vendor/supplier for specific details. To learn more about how your health care facility can reduce energy expenditures by switching to ENERGY STAR qualified products, including lighting, commercial kitchen appliances, office equipment, and light commercial HVAC equipment, visit: <http://energystar.greenhealthcare.ca/help>

Above all, look at organic waste solutions that work best for your unique organisation and avoid a “one-size-fits-all” solution.

CASE 1

Children’s Hospital of Eastern Ontario - Ottawa ON

Think beyond the obvious! The Children’s Hospital of Eastern Ontario (CHEO) has started to collect organic waste in various staff lunch rooms and puts it in the hospital’s main organic waste system for collection by the City of Ottawa which has had an organic waste compost programme for about ten years.

When they began the initiative, *“Everyone was afraid it would smell up the lunch room,”* says Dr. Curtis Lavoie, one of CHEO’s many green champions. *“Someone once actually dragged the compost bin out into the hallway because of a bad smell. It turned out to be coming from the refrigerator.”* The best way to achieve success with a new initiative like this is, according to Dr. Lavoie, *“by talking to the people who are going to use it, and listening to their feedback. The chance to be heard is a powerful sedative for contrarians.”*



CASE 2

The Ottawa Hospital – Ottawa ON

The Ottawa Hospital has a composting programme set up the Civic campus in the kitchen and cafeteria and also in the General Campus’s kitchen. They will soon be offering composting in the General’s cafeteria once renovations are completed to make room for the new waste stations. The next phase will see composting offered at the Riverside campus.

Currently, all compostables are picked up by a third-party contractor. “We don’t currently compost on-site,” claims Sustainability Coordinator Jessica Heiss, “but this is something we will be looking into as we further evaluate patient food waste volumes. Overall, our composting programme is working very well, with positive feedback from staff, visitors and patients. Having this programme in place also allowed us to have zero waste BBQs and compost food waste from a very large event. This generated a lot of positive feedback for the Green Team!”

CASE 3

Ross Memorial Hospital – Lindsay ON

In addition to a myriad of environmental stewardship initiatives succeeding at the Ross Memorial Hospital, the organisation’s Go Green Team has also embraced a vermiculture program which earned the hospital a *Green Health Care Award* from the Canadian Coalition for Green Health Care and the Ontario Hospital Association, and commendation from Accreditation Canada.

The program involves tens of thousands of red-wiggler worms which help speed up the composting of all vegetable food waste. Soil created from the compost enriches the Continuing Care therapy garden in which patients help cultivate herbs and vegetables which are then used by the cooks in the Nutrition Services Department as they create healthy meals to sell in the cafeteria. The hospital prepares 270,000 meals per year.

Since January 2008, 9,560 lbs of food waste has been separated and fed to the worms (almost 2 tonnes each year). The Go Green Team is currently investigating additional composting alternatives, such as mechanical dehydrators and composters, to handle the balance of their food waste.

Tens of thousands of red-wiggler worms help Ross Memorial Hospital in Lindsay, Ontario turn food waste into compost for on-site gardens.

CASE 4

Homewood Health – Guelph ON

Homewood Health collects over 19 tonnes of organic waste per year, the majority of which comes from the main kitchen including the production and returned trays area which includes uneaten client food and condiments.

All food waste is collected in large totes lined with biodegradable bags and makes its way to a licensed composting facility where the organic waste is mixed with carbon material (yard waste and other wood-based materials) and then subjected to the natural composting process in a covered windrow system. After the eight week period, the resultant compost is then further matured and screened to appropriate particle size for end market use as pathogen-free landscape soil amendment.

Their organic yard waste is also put through a natural composting process. According to Keith Sopha, Manager of Housekeeping, Linen and Space at Homewood, *“We have 50 acres of land so we have plenty of space to do on-site composting of this organic yard waste. When we take down trees we use as much wood as we can. We’ve even built a few nursing stations from trees we milled. The mulch is stored by our barn and used as bedding and as walkways to the river. Our 2005 waste reduction award, received from the Recycling Council of Ontario, is even framed in reclaimed materials - from an old floor joist removed during a renovation.”*

CASE 5

St. Michael’s Hospital – Toronto ON

With an average of 1,140 meals served per day in this 450-bed facility, you can imagine there is a lot of organic waste generated when kitchen staff prepares meals and gathers food waste from returned patient trays.

Approximately 22 tonnes or 24% of St. Michael’s Hospital’s recyclables each month fall into the organic waste category and for about fifteen years that waste has been sent for composting thereby keeping over 264 tonnes of waste out of landfill each year and helping the organisation control its ecological footprint.

“Sending that volume of organic waste to landfill each month costs approximately \$1,800” says Eduarda Calado, St. Michael’s Greening Strategy Coordinator, *“the same as sending it for composting so the more earth-friendly solution costs no more making it cost neutral. To further reduce our costs, this year we will be investigating on-site organic processing technology.”*

CASE 6

Cornwall Community Hospital – Cornwall ON

A kitchen waste audit at the Cornwall Community Hospital revealed approximately 175 lbs of waste being generated and thrown into garbage bins each day; approximately 75% of which was food waste contributing to higher than necessary landfill charges, foul odours, and leaching emanating from the kitchen dumpster.

Their solution was to install a multi-stage heating and dehydration unit that reduces the waste load by as much as 90%, resulting in a sterile bio-mass suitable for use as a soil amendment for personal or institutional gardens. Water extracted by the process is drained into the sewer system.

Based upon local waste hauling fees, the hospital estimates it will save approximately \$5500 per year meaning the dehydrator will pay for itself within four years and the hospital’s yearly waste to landfill will drop by approximately 30+ metric tonnes.

According to Alan Greig, Vice President of Support Services, *“this will increase once we are finished our major construction and all services are brought onto one site in the third quarter of 2014. At that time, our projections will be exceeded and we will be significantly reducing our ecological footprint and our organic waste management expense.”*



Thanks to the installation of a multi-stage dehydration unit in the kitchen at the Cornwall Community Hospital, food waste easily becomes a sterile bio-mass suitable for use as soil amendment in personal or institutional gardens; cutting landfill and haulage costs by \$5,500 per year.

Other considerations to reduce organic waste*

Conducting a waste stream audit of your entire food service department is the start of determining the type and amount of waste produced by volume and weight. This can be done by in-house personnel or by trained third-party consultants. Students and volunteers may also be pressed into service to assist in the audit.

To assist in identifying specific foods that are 'leftover' by clients and patients, conduct regular returned patient tray audits. This may help determine if portion sizes are appropriate and reveal non-food such items as salt and pepper packets, and drink straws that are unused yet routinely become trash.

Auditing food leftover at portioning and beltline stations can also provide insights into whether forecasted demand for certain foods is higher than necessary, allowing you the opportunity to right-size your preparation and serving strategies.

Allowing patients to choose the foods they eat also has a potential to prevent disliked foods from being returned on trays and added to the organic waste stream.

Proper waste separation and disposal/diversion can be enhanced by incorporating the composting or food waste recycling station into your returned tray stripping area.

NOTE: In Ontario, operators of public hospitals classified as a class A, B or F hospital in Regulation 964 of the Revised Regulations of Ontario, 1990 (see O. Reg 102/94 and 103/94) have obligations to both conduct a waste audit and create a formal waste reduction plan which must be made public.

* Mior, Christine (2009). *Strategies to reduce waste in patient food services.*

ARAMARK Healthcare Canada White Paper. www.greenhealthcare.ca/images/publications/h2010102%20waste%20reduction%20research%20paper.pdf

Resources

Biogas Association - biogas, anaerobic digestion and renewable energy (www.biogasassociation.ca/bioExp/index.php/site/infor/facts_and_information)

Canadian Council of Ministers of the Environment - compost standards (www.ccme.ca/assets/pdf/compostgdlns_1340_e.pdf)

Champion Industries – pulpers and food waste decomposition systems (www.championindustries.com)

Food Cycle Science – dehydration technology (www.nofoodwaste.com)

Food Waste Inc. - dehydration technology (<http://foodwasteinc.com>)

Hobart Canada – food-waste disposers and waste handling technology (www.hobart.ca)

IMC - food-waste management and composter technology (www.imco.co.uk)

InSinkErator – food-waste disposers (www.insinkerator.ca)

MASS Environmental Services Inc. – organic waste composters (<http://massenv.com/index.php>)

Meiko – warewashers and waste handling equipment (www.meiko.us)

Ontario Ministry of Agriculture, Food and Rural Affairs – Biogas (www.omafra.gov.on.ca/english/engineer/ge_bib/biogas.htm)

Somat – composting, pulping, shredding and dehydrating technologies (www.somatcompany.com)

Susteco AB – on-site composting technology (www.bighanna.com)

Vermiculture Canada – composting with worms (www.vermica.com)

Wright Tech Systems Inc. - biological drying and waste-to-energy technology (www.wrighttech.ca)

NOTE: Due diligence and sound financial analysis is required on your part in selecting an organic waste solution to suit your organisational needs. Information contained in this paper is provided as a public service. The Canadian Coalition for Green Health Care in no way endorses any of the mentioned vendors or their products/services.

Author contact information:

Kent Waddington, Communications Director
Canadian Coalition for Green Health Care
kent@greenhealthcare.ca



A waste audit will quickly show a variety of opportunities within your organisation to redirect 'waste' and reduce your ecological footprint. Your team may be surprised at the findings and the potential savings.



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