



# Understanding Countertop Compost Units: Final Report

December, 2023

SASKATCHEWAN  
**WASTE  
REDUCTION  
COUNCIL**



## Table of Contents:

Executive Summary_____	Page 1
Purpose_____	Page 2
Methodology_____	Page 3
Phase 1_____	Page 3
Phase 2_____	Page 4
Results_____	Page 8
Phase 1_____	Page 8
Phase 2_____	Page 13
Conclusions and Recommendations_____	Page 18
Appendix I: Volunteer testing data_____	Page 19
Appendix II: Supplementary interviews_____	Page 23

The SWRC thanks the City of Saskatoon and City of Regina for their financial support of this research project.

---

208-220 20<sup>TH</sup> ST. WEST, SASKATOON, SK S7M 0W9

PH: (306) 931-3242  
INFO@SWRC.CA

FAX: (306) 955-5852  
WWW.SWRC.CA

# Executive Summary

Because of the importance of managing organics in municipal waste streams, we wanted to test whether countertop compost units - electric, indoor appliances that process food waste - are a useful tool for Saskatchewan.

We chose four models to test: Vitamix's Foodcycler FC-50, Vitamix's larger model the Foodcycler Eco 5, Pela's Lomi, and the Reencle. Both Vitamix models and the Lomi process a few litres of food waste at a time. Each batch takes several hours and creates a dry, powdery finished product. The Reencle has a flow-through system. Users add food waste continuously to a heated and stirred inner chamber and remove excess material when the chamber is overly full.

In the first stage we "stress-tested" the units by processing as many loads as possible over several weeks. In the second stage of testing, we placed the units with volunteer households and business to gauge their user experience. We also interviewed other countertop composter users in Saskatchewan. Finally, we tested samples of the finished material to determine its suitability as a soil additive.

The Vitamix units and Lomi handled continuous use well and easily processed different types of organic material. When functioning properly, the Reencle was also able to process all of the different types of material. During testing one of the units experienced mechanical failure. One also malfunctioned due to user error.

Our volunteers gave very positive feedback about the Vitamix units and Lomi. They said the units felt fun, convenient, and clean to use. Our interviewees said the same. The most common use for the finished material was adding it to an outdoor garden. The volunteer feedback on the Reencle was mixed, with one of three volunteers noted issues with excess moisture, bad smells, and flies. We did not find any Reencle users outside of our volunteers to interview.

Testing the finished samples revealed that the Vitamix units and Pela Lomi do not make mature compost - i.e. stable, microbially-decomposed organic matter. They create dried and pulverized food waste powder. This powder can be stored indefinitely if it stays dry. It can be taken to an outdoor garden, compost bin, or green cart to finish breaking down, but does not work well in indoor pots. The Reencle made a product much closer to traditional compost and can be used indoors or outdoors.

Overall we found that countertop composters - particularly the models that create dried and pulverized food waste - can be a good option in situations where other composting methods are not available or not subjectively appealing. This includes residences without yard space or green cart collection, or businesses with moderate amounts of food waste.

# Purpose

Dealing with organics, especially food waste, is a vital part of waste management. Every household has some amount of food waste, as do most institutions and businesses. These materials tend to be wet, heavy, and putrescent (able to rot). They can cause unpleasant odours and attract pests such as flies, wasps, and rodents. In landfills, they take up space and produce methane, ammonia, and other anaerobic byproducts.

In Saskatchewan, organics are typically handled through composting, either at home or in larger facilities. Composting uses aerobic microbial activity to decompose organic waste into a stable, useful soil amendment. Mature compost does not create odours, produce pollution such as methane or ammonia, or attract pests. It can also be used to improve soil fertility and plant growth.

Countertop compost units - electrically-powered, indoor appliances meant to rapidly process food waste into a more stable form - are marketed as a compact, odourless, and convenient way for households to manage their organic waste. These units are relatively new and more expensive than traditional compost bins.

The SWRC is interested in finding out if countertop composters can be an effective tool for organic waste management in Saskatchewan, especially for multi-unit residences and/or business settings. In particular we undertook this study to determine:

- How well these units function over several months of continuous use.
- How much these units reduce the weight and volume of organic waste.
- Whether the finished material is mature compost, with equivalent soil benefit, or requires further processing.
- Best practices for using countertop compost units.

# Methodology

Based on availability in Canada, we selected four models of countertop composter to test. Two previously suggested brands were ruled out: Tero went out of business in June 2023, and the beyondGREEN Composter is not available in Canada. The ten units we tested were:

Unit	Cost	Number purchased	Capacity
Vitamix Foodcycler FC-50	\$555 CAD	3	2 L
Vitamix Foodcycler Eco 5	\$805 CAD	1	5 L
Pela Lomi	\$615 CAD	3	3 L
Reencle	\$760 CAD	3	Optimum 0.5 kg/day, up to 1 kg/day

## ***Phase 1: Direct SWRC testing***

Our investigation had two phases. In the first phase, we tested the electric composters under direct SWRC supervision. This “stress testing” was meant to determine:

- Endurance—how do the units stand up to continuous heavy use?
- Flexibility—can the units handle the different blends of kitchen waste that might be produced in households, businesses, and institutions?

Lisa Howse, SWRC’s Compost Education Coordinator, set up the ten units and tested five different “blends” of organic waste:

- Household blend—primarily fruits and vegetables with some coffee grounds, tea bags, egg shells, cooked food, bones, and paper waste.
- Office blend—primarily coffee grounds and paper waste, with some tea bags, fruits, vegetables, and cooked food.
- Paper blend—primarily paper waste with some fruits, vegetables, and disposable wooden utensils.
- Animal protein blend—primarily bones and meat with some cereal products, cooked food, fruits, and vegetables.
- Challenge blend—loads designed to be unusually wet, smelly, large, fibrous, or unbalanced.

We tracked the weight, volume, and composition of batches. We also measured the length of time to process, energy usage, decibels, change in temperature, and change in humidity. The finished product was separated by unit and blend, and stored in sealed bags for further testing during phase 2.

## ***Phase 2: Volunteer testing and further investigation of samples***

### **Volunteer Testing**

In phase 2 the SWRC gathered more subjective data about user experience, in order to determine:

- Best practices—who do these countertop composters work best for, and in what kind of situations? Are they appropriate for residents, businesses, or institutions? Are they useful as a supplement where other composting options exist, or are they only relevant when there are no other simple options?

We placed our test units with ten different volunteer households or offices, prioritizing households with limited options for their organics, such as apartments without green cart pick up or yard space. The offices we worked with included two small (1-10 employees), one medium (10-25 employees) with an onsite cooking program, and one large (25+ employees). Over several weeks these volunteers tracked the loads processed, any specific issues encountered, and their overall level of satisfaction. At the end of the testing period volunteers were allowed to either keep their units or return them to the SWRC.

We supplemented the hands-on user data with interviews from households and businesses that were already using countertop composter units. We interviewed six households, one government organization, and one school.

### **Testing Finished Samples**

Phase 2 also included further testing on samples of finished materials from phase 1, in order to determine:

- Soil suitability—Is the finished product from electric composters comparable to mature compost, and can it be used in the same way?

The finished materials from phase 1 were blended into six aggregated samples, plus two “control” samples of mature compost:

1. Reencle material
2. Vitamix Foodcycler FC-50 material
3. Vitamix Eco 5 material
4. Lomi fast cycle material
5. Lomi medium cycle material
6. Lomi slow cycle material
7. (Control) Mature home compost from a backyard compost bin
8. (Control) Mature industrial compost from an outdoor windrow site

The samples were tested for their maturity and soil suitability by A&L labs in Ontario, the only lab in Canada certified by Canada's Compost Quality Alliance (CQA). The SWRC also performed our own mould and germination tests.

For the mould test, ~500 mL of each sample blends and control blends were placed in their own unsealed mason jar. We also added a third control in the form of pure coconut coir, a stable potting medium. These samples were saturated with water and left exposed to the air at room temperature for 11 days to see whether they would show signs of active decomposition such as mold or odour.

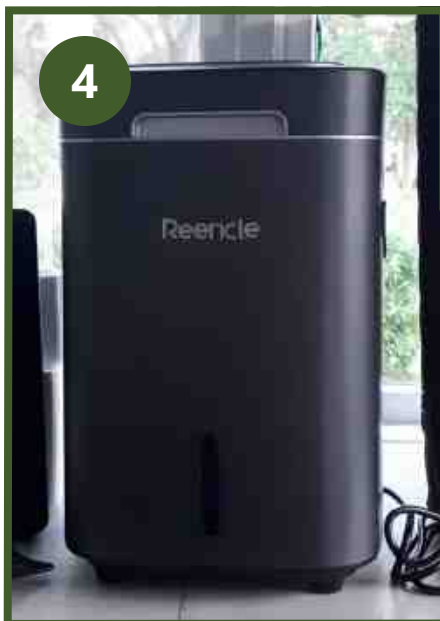
For our germination test, we tested three concentrations of each of the six sample blends, plus three control blends:

- 90% coconut coir and 10% testing sample
- 50% coconut coir and 50% testing sample
- 100% testing sample

These blends were thoroughly moistened and sprinkled with watercress seeds. (Watercress is often used for germination tests as its seedlings are *very* sensitive to environmental changes.) The pots were misted each day to keep them uniformly damp and checked for germination rates over 14 days.



## Countertop Compost Units Tested:



1. (top left) - Vitamix Foodcycler FC-50
2. (top right) - Vitamix Eco 5
3. (middle right) - Pela Lomi
4. (bottom left) - Reencle



## Organic Waste Blends Tested:



**Organic waste blends tested:**

1. (top left) - household blend
2. (top middle) - office blend
3. (top right) - animal protein blend
4. (bottom left) - paper blend
5. (bottom right) - challenge blend

# Results

## Phase 1: Direct SWRC testing

### Foodcycler FC-50 (3 units)

- 226 total batches
- 134 kg, 293 L total waste
- Became 34 kg, 99 L end product
- 75% weight reduction
- 66% volume reduction
- 4 loads jammed

### Foodcycler Eco 5 (1 unit)

- 77 total batches
- 47 kg, 107 L total waste
- Became 12 kg, 36 L end product
- 74% weight reduction
- 66% volume reduction
- 2 loads did not fully dry, 1 load jammed

### Lomi (3 units)

- 228 total batches
- 137 kg, 309 L total waste
- Became 33 kg, 102 L
- 76% weight reduction
- 67% volume reduction
- 1 load jammed

### Reencle (3 units)

- 155 additions
- 49 kg, 104 L total waste
- Harvested 5 L, ~10 L remains in machines
- Calculating ~86% volume reduction
- 0 loads jammed
- 1 unit experienced mechanical failure
- 1 unit malfunctioned due to user error

## General Observations on Endurance and Flexibility

The instruction manuals of every unit recommended cutting large food waste into smaller pieces and avoiding tougher materials like cardboard or popsicle sticks. The Foodcyclers and Lomi stress not overfilling the bucket and the Reencle advises to not add more than 1 kg/day. In practice, these machines demonstrated impressive resilience and flexibility to more challenging loads. During testing:

- Machines were regularly given loads that filled the buckets over capacity, and the Reencle received loads over 1 kg multiple days in a row without issue.
- No food waste was cut into smaller pieces. Large items like grapefruits and cauliflower stems were added whole.
- Loads made entirely of (damp) wadded paper towel, take-out wrappers, cardboard, and paper straws consistently processed correctly.

The only items that were not fully processed were:

- In a load of entirely cherry pits, the pits were dried but not pulverized.
- In one Vitamix Eco 5 load, a dried orange was not caught by the blades and came out whole.
- In one Lomi load, a cardboard takeout container was not caught by the blades and came out whole.
- The Foodcycler FC-50, Foodcycler Eco 5, and Lomi all struggled to process a whole pineapple top. Each unit jammed, although the Foodcycler Eco 5 and Lomi processed the pineapple tops into 3-4 cm shreds before jamming.

All units reduced the volume and weight of food waste significantly. (This was easiest to quantify with the Foodcyclers and Lomi as they process discrete batches, while the Reencle has a continuous flow system which makes it more difficult to take exact measurements.) The office blend and paper blend had the least volume reduction, with more fibrous and fluffy end results.

The carbon filters of each unit were able to remove smells from challenging loads of aged food waste within several minutes of starting a cycle. The carbon filters failed after ~20 challenging batches for the Lomi and ~30 for the Foodcyclers. Replacing the carbon filters and wiping down the machine components solved the problem. No unit's filter replacement lights was triggered, leading us to believe that the lights are based on number of loads or time passed rather than on an internal sensor. The Reencle carbon filters did not need replacing during the test.

No unit was able to handle compostable plastic bags; the bags were shredded but still present.

No unit significantly changed the humidity or temperature of the nearby area, although some showed a moderate increase directly behind their air vents.

The energy use of each unit was moderate but notable, ranging from 0.5-1 kWh per batch for the Foodcyclers and Lomi. The Reencle consumed ~1 kWh/day.

### **Specific Observations: Foodcycler FC-50**

The Foodcycler FC-50 advertises itself as a food waste dehydrator and/or organic waste solution, not a composter. This matched our experience with the units, which pulverized and dehydrated waste but did not seem to cause any biological decomposition—the finished product did not match the colour, texture, or odour of mature compost. As long as the loads processed correctly and the material came out dry, they effectively took heavy, putrescent food waste and made shelf-stable food waste powder.

The FC-50 jammed four times during testing. Each time, the machine stopped itself and an indicator light flashed. Each jam was easy to locate and remove; every one was caused by fibrous material stopping the pulverizing arm in the bucket.

Each cycle took 4-8 hours and used an average of 0.66 kWh/batch, drawing the most power during the start of the cycle (~410 W) and declining to a low of ~170 W. For noise level, the units registered 57 dB which is similar to a dishwasher or regular conversation. Humidity and temperature did not change significantly in the room the machines were in, but humidity was 12% higher directly behind the fan.

In terms of design, the units started easily, lids closed without problem and the buckets were simple to seat. Some error codes (flashing lights) required checking the manual to understand. The bucket also came with an optional lid with a carbon filter, so that it could be used as a kitchen collection container outside of the actual machine.

### **Specific Observations: Foodcycler Eco 5**

The Foodcycler Eco 5 is also made by Vitamix but has roughly double the capacity of the FC-50.

The Eco 5 jammed only once during testing, when an entire pineapple top was added. The machine did not indicate that it was jammed, but the blade was stuck. It was extremely difficult to undo the jam, requiring needle-nosed pliers and a great deal of caution, as the Eco 5's bucket has sharp exposed blades. Two large loads of soaked coffee grounds also failed to process correctly, and were still damp when the cycle ended.

Each cycle took 8-12 hours and used an average of 1.55 kWh/batch. The unit cycled continuously between a high and low power draw (450 W—15 W). The unit registered 51 dB, similar to a running fan or light rain. Humidity and temperature did not change significantly in the room the machine was in or behind the fan.

In terms of design, the bucket was tricky to seat. It often seemed in place but the machine's lid wouldn't close. It was sometimes difficult to tell if the machine had actually started; sometimes the button wasn't responsive. The bucket comes with an optional lid with a carbon filter, so that it can be used as a kitchen collection container.

### **Specific Observations: Pela Lomi**

The Lomi advertises itself as a composter and states that it turns food waste directly into soil. This did not match our assessment of the end product, which was dehydrated and pulverized but not decomposed.

The Lomi jammed twice during testing—once when a pineapple top was added and once while processing a normal house blend with one compostable bag. (Compostable bags did not jam in other loads.) The pineapple top was easy to remove, but the second jam was difficult to deal with. The pulverizing arm was locked in place and the bucket was also locked in the machine. Removing the bucket from the machine required tapping the pulverizing arm cautiously with a hammer to decouple the bucket from the machine rotor, and then needle-nosed pliers to pull material out. Neither of these jams triggered an indicator light. Finally, loads that were mainly citrus fruits created a 1-2 mm layer of flat, leathery waste on the bottom of the bucket.

The Lomi has three different load settings: Eco-Express Mode (4-8 hours), Lomi Approved Mode (8-12 hours), and Grow Mode (12-24 hours). They recommend using *only* the Grow Mode to make compost for adding to plants, and that a LomiPod be added to each Grow Mode cycle. LomiPods are tablets described as "helpful microorganisms that transform your food scraps into pure plant food." (It is unclear what the intended use of the finished material from the other settings is.) They also state that both the Lomi Approved Mode and Grow Mode are suitable for compostable plastic film, although we found that in all settings bags were only shredded and did not decompose.

The Lomi used an average of 0.52 kWh on the Eco-Express Mode, 0.69 kWh on the Lomi Approved Mode, and 0.64 kWh on the slower Grow Mode. In every mode, the units cycled continuously between high and low power draw (515 W—12 W). The units normally registered 57 dB (similar to a dishwasher or normal conversation), although roughly half of all batches caused at least a few minutes of louder creaking and groaning. These creaks and groans reached 75-80 dB, which is similar to a running vacuum or alarm clock. Humidity and temperature did not change significantly in the room the machines were in, but during the Eco Express Mode and Lomi Approved Mode the air directly behind the vent reached 32-33°C and humidity increased by 35%.

In terms of design, the bucket was usually easy to seat but occasionally required the pulverizing arm to be slightly rotated in order to couple with the machine. The lid is somewhat tricky to close although the indicator markings on the side help. The loads are easy to start. The bucket does not come with a lid for using it as kitchen collection container outside of the machine.

### **Specific Observations: Reencle**

The Reencle advertises itself as a composting machine. This matched our assessment of the end product. The units come with a starting mix of sawdust, carbon pellets, and microbes. The material is heated and stirred by internal paddle arms. The Reencle does not dehydrate waste and it does not process discrete batches; it leaves material damp and keeps an internal reservoir of material. Reencle states it can handle adding up to 1 kg of food waste per day, and has no required minimum. Once the chamber is full to above the maximum mark, Reencle recommends taking out material until it is at the minimum line. The food waste in the Reencle looked like mature compost, although we did not confirm this until phase 2.

The Reencle never jammed during testing, even when an entire pineapple top was added to the chamber. However one of the Reencles failed when its internal paddles stopped moving. A second unit appeared to fail but it was due to user error. It became excessively wet because the vent of the carbon filter was not properly uncovered. Customer service was easy to contact and provided two replacement units, free of charge, which were used in phase 2 of testing.

The Reencle used an average of 1.05 kWh/day. The units cycled continuously between a high and low power draw (120 W—40 W). The units registered 40 decibels which is similar to a quiet library. Humidity and temperature did not change significantly in the room or behind the fan.

In terms of design, the Reencle was easy to open and add material to. The lid is motion activated and will open if something is in front of the sensor, although this feature can also be turned off. The buttons are responsive and also light up when they register a touch. The units do not come with any kind of collection container that could be used in the kitchen. They do come with a small trowel meant for removing material when it is ready.



## Finished samples from phase one:



1. (top left) - Vitamix Foodcycler FC-50
2. (top right) - Vitamix Eco 5
3. (right, top to bottom) - Pela Lomi Eco-Express Mode, Lomi Approved Mode, and Grow Mode
4. (bottom right) - Reencle



## ***Phase 2: Volunteer testing, interviews, and further investigation of samples***

### **Volunteer Testing and Interviews**

Appendix I contains detailed volunteer testing responses.

Each of our ten units was given to a volunteer household or business to gather user data over several weeks. (The Reencles which malfunctioned during phase 1 of testing were replaced with new units by the parent company.) In addition to making sure the units functioned properly during typical use, our study focused on the subjective experience and level of satisfaction of each user.

The volunteers using the Pela Lomi, Vitamix Foodcycler FC-50, and Vitamix Foodcycler Eco 5 reported very similar experiences, allowing us to draw out some strong themes:

- These units are easy to use and take little time.
- These units create a small amount of noise, but it is not objectionable.
- These units rarely or never create smells while running, although the finished material smells like roasted food.
- These units are about the right size for small households and small businesses. The largest unit, the Vitamix Foodcycler Eco 5, can handle larger households and moderately-sized businesses.
- The volunteers were fully satisfied with the units and enjoyed adding them to their routine. They felt clean and safe.

The feedback from the three volunteers using Reencles was more mixed. Two volunteers reported no problems, and one volunteer reported serious problems with excess moisture, anaerobic smells, and flies. Overall the themes that emerged for the Reencle were:

- It is easy to add food waste and takes little time.
- The material in the unit sometimes gets too wet and begins to smell bad.
- Taking material out is a bit messy but not terrible. It is unpleasant if it is wet and smelly.
- The volunteers had varying levels of satisfaction. Some would rather consider other options for managing food waste.

### **Interviews**

Appendix II contains detailed interview responses.

We found eight other countertop composter users from Saskatchewan to interview. Four of them used a Vitamix Foodcycler and four used a Lomi. Lining up with our volunteer data, every interviewee reported they were fully satisfied with their units and felt they were a good fit for their needs. Two volunteers had units fail (after 1 and 3 years respectively), and both chose to replace them. Without prompting, nearly every user emphasized that they liked the countertop composters because they felt clean, safe, and simple.



## Testing samples of finished material: A&L lab results

The results of the A&L Lab testing show that the finished material from the Pela Lomi, Vitamix Foodcycler FC-50, and Vitamix Foodcycler Eco 5 is *not* compost. It is pulverized and dehydrated food waste. The key indicator of this is pH. Food waste is acidic, as is immature compost that is still being broken down by microbes. However once decomposition is complete, mature compost has a neutral-to-slightly alkaline pH of 7-8, with values of 7.5-7.7 being ideal. Our two control samples of mature compost had a pH of 7.7, while the samples from these machines were all acidic (4.4, 4.7, 6.5, 4.8, 4.8). By contrast, the Reencle had a pH of 7.2, indicating that like the control samples it is also mature compost.

Another standard compost maturity test involves measuring the amount of carbon dioxide being exhaled by microbes in the compost samples over time. This type of respiration test indicates the level of microbial population and activity, which should be higher in immature compost than mature compost. A&L Lab attempted to perform this test, but our samples were too dry (<20% moisture) to give valid results. This highlights the challenges of using conventional compost tests on samples that are the result of processes other than composting.

## Lab Test Results of Finished Product and Control Samples

	Industrial Compost (outdoor windrows)	Home compost (outdoor bin)	Reencle	Pela Lomi (fast cycle)	Pela Lomi (medium cycle)	Pela Lomi (slow cycle)	Vitamix Foodcycler FC - 50	Vitamix Foodcycler Eco 5
<b>pH</b>	7.7	7.7	7.2	4.4	4.7	6.5	4.8	4.8
<b>C:N ratio</b>	*n/a	27:1	48:1	51:1	52:1	45:1	47:1	46:1
<b>Moisture - %</b>	11.5	34.4	7.5	4.8	4.2	21.2	7.3	4.7
<b>Total nitrogen (%)</b>	0.5	1.6	2.1	2.0	2.1	2.0	2.0	1.9
<b>Nitrate (NO3) - ppm</b>	53	664	5	15	52	3	76	45
<b>Soluble salt - ms/cm</b>	2.2	4.4	6.0	3.3	3.9	3.9	5.0	4.3
<b>Phosphorus - ppm</b>	534	658	829	711	940	827	1060	1139
<b>Potassium - ppm</b>	2349	2977	3494	2835	3099	2710	3026	2883
<b>Magnesium - ppm</b>	1003	1111	718	573	754	607	650	652
<b>Calcium - ppm</b>	4322	4792	1907	1181	1878	1481	2653	1856
<b>Sulfur - ppm</b>	121	114	590	214	484	159	378	253
<b>Zinc - ppm</b>	17.9	26.5	5.6	7.6	8.9	10.8	8.3	9.5
<b>Manganese - ppm</b>	80	46	27	14	21	12	24	47
<b>Iron - ppm</b>	131	65	15	15	22	26	34	50
<b>Copper - ppm</b>	1.3	2.5	0.7	1.9	2.6	1.7	2.1	2.4
<b>Boron - ppm</b>	6.5	7.1	4.9	2.9	3.3	1.8	2.6	2.1

\*Not available due to testing error.

## **Testing samples of finished material: mould and germination test**

In our mould test, we exposed samples to water and air for several days. Mould grew on the samples from the Pela Lomi, Vitamix Foodcycler FC-50, and Vitamix Foodcycler Eco 5, confirming they are not fully decomposed. By contrast, our samples of potting mix (coir), industrial compost, home compost, and the Reencle sample did not develop any mould.

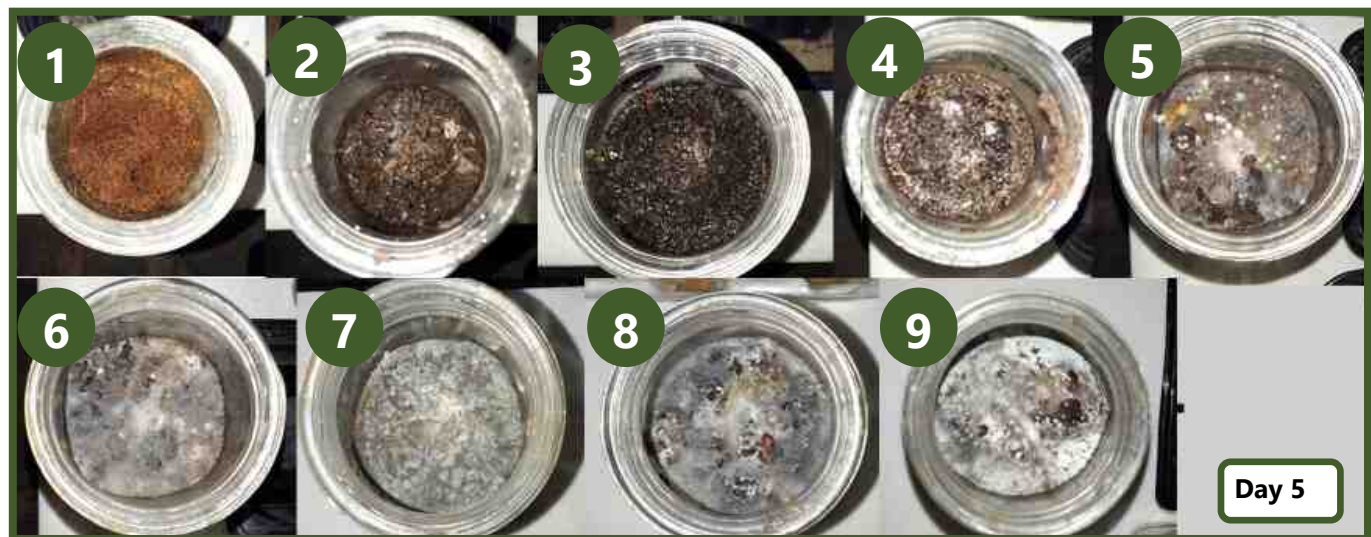
For our germination test, we tested three concentrations of each of the six sample blends, plus three control blends:

- 90% coconut coir and 10% testing sample
- 50% coconut coir and 50% testing sample
- 100% testing sample

Over 14 days, the sensitive watercress seeds germinated fully or partially in all the mature compost samples as well as the Reencle samples. There was partial germination in the 10% concentration samples of the Pela Lomi, Vitamix Foodcycler FC-50, and Vitamix Foodcycler Eco 5, and no germination at higher concentrations.

### Mould test results

1. Coir - No mould developed. Woody smell.	2. Industrial compost - No mould developed. Earthy smell.
3. Home compost - No mould developed. Earthy smell.	4. Reencle - No mould developed. Woody smell.
5. Lomi fast cycle - White, grey, and blue mould developed on day 5. Rotting smell that changed to musty, fungal smell over time.	6. Lomi medium cycle - White, grey, and yellow mould developed on day 5. Rotting smell that changed to musty, fungal smell over time.
7. Lomi slow cycle - White and grey mould developed on day 3. Rotting smell that changed to musty, fungal smell over time.	8. Vitamix Foodcycler FC-50 - White, grey, and blue mould developed on day 5. Rotting smell that changed to musty, fungal smell over time.
9. Vitamix Foodcycler Eco 5 - White, grey, and blue mould developed on day 5. Rotting smell that changed to musty, fungal smell over time.	





### Germination test results - Day 14

	90% coir, 10% test sample	50% coir, 50% test sample	100% test sample
<b>1. Coir</b>	-	-	90-100% germination
<b>2. Industrial compost</b>	90-100% germination	80-90% germination	10-20% germination
<b>3. Home compost</b>	50-60% germination	50-60% germination	10-20% germination
<b>4. Reencle</b>	50-60% germination	10-20% germination	10-20% germination
<b>5. Lomi fast cycle</b>	0-10% germination	No germination	No germination
<b>6. Lomi medium cycle</b>	0-10% germination	No germination	No germination
<b>7. Lomi slow cycle</b>	10-20% germination	0-10% germination (single sprout)	No germination
<b>8. Vitamix Foodcycler FC-50</b>	0-10% germination	No germination	No germination
<b>9. Vitamix Foodcycler Eco 5</b>	0-10% germination	No germination	No germination



# Conclusions and Recommendations

## Endurance and Flexibility

The Pela Lomi, Vitamix Foodcycler FC-50, and Vitamix Foodcycler Eco 5 all demonstrated considerable endurance and flexibility. We would expect them to continue working for one to several years of typical use, and to be able to deal with the types of organic waste made in most households or offices.

The Reencle was somewhat less reliable, as one of our three test units experienced serious mechanical failure during phase 1. One volunteer also reported the Reencle getting too wet during phase 2. We are not sure if these issues would be significant with a larger sample size.

## Soil suitability

The material created by the Pela Lomi, Vitamix Foodcycler FC-50, and Vitamix Foodcycler Eco 5 is not compost; it is dehydrated food waste. It needs more microbial decomposition to be fully stable. It is safe to use in outdoor gardens or to put in other compost bins/green carts where it can finish decomposing in a microbe-rich environment, but is volatile enough that using it on indoors plants will lead to mould or odour problems. While the Foodcycler claims only to be a dehydrator (and not a composter), the Lomi's claim to make mature compost seems exaggerated.

The material created by the Reencle is much closer to regular mature compost and should be safe for application in both indoor plants and outdoor gardens. It will not develop any mould. Like regular mature compost, it should only develop an odour if kept fully waterlogged and/or in an airtight container for at least several days.

## Best practices

Because of the higher cost, energy use, and lower quality of the finished product compared to mature compost, we believe that traditional backyard composting or green cart systems are still superior in most circumstances. Countertop composters can be a useful in specific situations where other food waste options are not available or unappealing. This includes:

- Residences without yard space or a green cart collection, such as apartments or townhouses.
- Businesses with a moderate amount of food waste, as long as there is buy-in from staff.
- Institutions and schools who want to use countertop composters for both organic waste management and education.
- Individuals without green cart service who find traditional composting methods too "gross."

# Appendix I: Volunteer testing data

## Volunteer testing—Vitamix Foodcycler FC-50

Volunteer:	Household (2 people)	Household (2 people)	Small office
Total loads run:	16	12	4
Feelings on time spent loading/emptying/using the unit:	Minimal	Minimal	Minimal
Feelings on loading the unit:	Very easy	Very easy. Noted that using unit's bucket as kitchen catcher worked best, and that big items did not require much chopping.	Easy. Kept unit's bucket in the fridge because ran a cycle ~once a week.
Feelings on emptying the unit:	Easy	Easy. Noted rarely requires more than tapping.	Easy, not messy.
Does the unit hold about the right amount for your needs, too little, or too much:	Right amount. Noted for large family might be a bit small.	Right amount. Noted for large family might be a bit small.	Slightly larger than required, ran only ~once a week if waiting until full.
Any noises from the unit:	Moderate white noise. "Screeching" during single jam.	Minimal white noise, dishwasher louder.	Minimal white noise, dishwasher louder.
Any smells from the unit:	No	No, other than "roasted food" smell of finished material.	Finished material's cooked fruit smell mildly unpleasant.
Any other observations or mechanical issues:	No	Don't always know how long is left in a cycle	No
What is done with finished product:	Initially adding to large indoor plant but noticed some mould. Now adding to outdoor planter box.	Storing in large container until spring, plan to use in outdoor garden planters.	Storing in large container, plan for an employee to take it home to compost it when needed.
Satisfaction with the unit, 1 (low) to 5 (high):	Insisted on 6.	5	5
Would you recommend a unit to people living in apartments:	Yes definitely	Yes	Yes, although noted they have less use for the finished material.
Would you recommend a unit to offices with breakrooms:	Yes definitely	Yes potentially	Yes, same effort as office recycling bin
Would you recommend a unit to anyone else:	Everyone	Any household without a green cart or who didn't like having a regular kitchen catcher	Potentially schools
Other comments:	Thinks it is an amazing machine.	The weight and volume are drastically reduced. And kitchen garbage is no longer smelly.	No

## Volunteer testing—Vitamix Foodcycler Eco 5

Volunteer:	Large office
Total loads run:	18
Feelings on time spent loading/emptying/using the unit:	Minimal
Feelings on loading the unit:	Easy—and fun!
Feelings on emptying the unit:	Easy
Does the unit hold about the right amount for your needs, too little, or too much:	Right amount for running every 1-2 days with food waste from break room.
Any noises from the unit:	Minimal white noise
Any smells from the unit:	One scent-sensitive person bothered by the specific smell of loads made from banana skins. No one else noticed.
Any other observations or mechanical issues:	No
What is done with finished product:	Storing in empty containers. Some given away. Some taken home and used as top dressing on indoor plants—no mould noted. Some taken home and used as additive to outdoor potting soil.
Satisfaction with the unit, 1 (low) to 5 (high):	5
Would you recommend a unit to people living in apartments:	Yes definitely
Would you recommend a unit to offices with breakrooms:	Yes
Would you recommend a unit to anyone else:	For any household without a green cart. Noted the volume and weight reduction is very useful.
Other comments:	It has been a lot of fun to experiment with



## Volunteer testing—Pela Lomi

Volunteer:	House (2 people)	Condo (2 people)	Medium office with cooking program
Total loads run:	3—unexpected medical issue interrupted trial	30	11
Feelings on time spent loading/emptying/using the unit:	Minimal and easy	Minimal, no more effort than throwing in garbage	Minimal and easy. Bucket washed in dishwasher.
Feelings on loading the unit:	Surprisingly easy, noted manual is overly cautious in chopping guidelines.	Very easy. Loaded scraps directly into bucket inside of unit.	Easy
Feelings on emptying the unit:	Generally very easy, noted one load done on fast cycle was still damp	Very easy. Noted they wash the bucket about once a week.	Very easy
Does the unit hold about the right amount for your needs, too little, or too much:	Right size, but noted kitchen catcher is larger than Lomi bucket so had to get used to running it before kitchen catcher is full.	A little small for 2 people that cook very frequently but manageable.	Far too small for their cooking program; made 351 meals during the test period. Enjoyed it as a supplement to other composting methods used onsite.
Any noises from the unit:	Minimal white noise.	Minimal white noise, no different than dishwasher.	Some crunching and creaking; not ideal to run it at same time as lecturing in the room.
Any smells from the unit:	No	No	Generally no, one load of entirely Brussel sprouts smelled sulfurous, one load of entirely eggs smelt egg.
Any other observations or mechanical issues:	No	No	No
What is done with finished product:	Added to outdoor garden bed on top of soil.	Storing in large container, no further plan yet.	Add it to their existing green bin service.
Satisfaction with the unit, 1 (low) to 5 (high):	5	5	5
Would you recommend a unit to people living in apartments:	Yes	Yes, definitely	Yes, definitely
Would you recommend a unit to offices with breakrooms:	Yes potentially	Probably not, did not think there would be much to put in	Yes, definitely. Noted it was much more “popular” to use than the task of emptying a normal kitchen catcher in the break room.
Would you recommend a unit to anyone else:	Acreages or lake cabins	Any household	Potentially a small café
Other comments:	“Got a kick out of using it”	Wonders how much electricity it uses.	“It’s been great to have a compost option that is low maintenance and non-stinky”

## Volunteer testing—Reencle

Volunteer:	Household (3 people)	Household (1 person)	Office/household—very few employees in office due to renovation; moved to household to continue
Total additions:	26	17	~80 (longer trial period)
Total removals:	3	1	6
Feelings on time spent loading/emptying/using the unit:	Minimal	Minimal	Considerable, if it wasn't for their level of interested, would be "too bothersome"
Feelings on loading the unit:	Very easy, noted the automatic lid feels "high tech"	Very easy	Prepping food waste a fair amount of work (is grinding it beforehand to break down faster)
Feelings on taking material out:	Easy but gets a bit of soil on the ground	Very easy	Easy but not sure where the max fill line is
Does the unit hold about the right amount for your needs, too little, or too much:	Overall right size but household often does all the cooking for the week on a single day, after which scraps needed to be added slowly	Right size or a little too big	Too little, seemed to be constantly too wet when adding food waste regularly
Any noises from the unit:	Minimal white noise, only when in the same room	No	No
Any smells from the unit:	Damp, woody smell from starting material	No	Yes, acidic and sour. Possibly anaerobic due to moisture.
Any other observations or mechanical issues:	Seems to get a bit too wet without adding dry paper	No	Noticed fruit flies and fungus gnats attracted to the moisture and smell.
What is done with finished product:	Added to outdoor garden beds	Currently storing in large container, no further plan yet	Added to outdoor garden beds
Satisfaction with the unit, 1 (low) to 5 (high):	4	4	3
Would you recommend a unit to people living in apartments:	Yes potentially	Yes	Maybe; consider it equally tricky to a vermicompost bin
Would you recommend a unit to offices with breakrooms:	Only if there is a specific person enthusiastic about running it	Maybe	Maybe, only if there is some food waste to add but not a lot
Would you recommend a unit to anyone else:	Potentially homes in bear country where outdoor composting is tricky	No	"People with more money than brains" or when there are no other options
Other comments:	No	No	No

# Appendix II: Supplementary interviews

## Interviews with those who already owned a countertop composter:

Interviewed:	Home Economics program at a high school
What kind of unit:	Vitamix Foodcycler
How long have you had it:	2.5 years
Why did you decide to get a countertop composter?	It is very important to model how to handle food waste to students, especially in a Home Ec program. Heard about electric composters at a PD event. Found it to be a good solution for their program.
Have you tried other compost or organic waste methods?	Yes. The school has a student-run organics collection program, taking material to an outdoor compost bin or nearby community garden compost bin. However students frequently forgot to empty buckets and they were left until smells and flies were an issue. Flies also got into indoor vertical garden beds of Home Ec program as a result. Community garden compost bin also a 15 minute walk from the classroom, students gone from class too long.
Feelings on time spent loading/emptying/using the unit:	Much less time needed than to maintain a traditional compost.
Any noises from the unit:	Minimal white noise, does not interfere with class.
Any smells from the unit:	No, even if material left in the buckets over the weekend the carbon filter in the lid takes care of it.
Any other observations or mechanical issues:	Bought 2 additional buckets to go with the single unit so that a container was always available for the class.
Does the unit hold about the right amount for your needs, too little, or too much:	About the right size. While they could make use of a unit with more capacity, do not have the counterspace to hold a larger machine.
What is done with finished product:	Storing in large container. Periodically give it away to students or take it home to their own outdoor garden bed.
Satisfaction with the unit, 1 (low) to 5 (high):	5
Would you recommend a unit to people living in apartments:	Yes
Would you recommend a unit to offices with breakrooms:	Yes
Would you recommend a unit to anyone else:	Potentially people with mobility issues or the elderly. Noted going outside to a compost bin or green cart in winter can be difficult.
Other comments:	No

Interviewed:	Government office
What kind of unit:	Vitamix Foodcycler
How long have you had it:	3 months
Why did you decide to get a countertop composter?	To incorporate composting as a connection to local science curriculum. The unit was purchased by a staff member in charge of Education programming.
Have you tried other compost or organic waste methods?	Personally the interviewee has tried vermicomposting and composting in a bin. Nothing else has been done in the office.
Feelings on time spent loading/emptying/using the unit:	Easy. The bucket is removable and works well as a kitchen catcher so others add to it.
Any noises from the unit:	Minimal white noise. Surprisingly quiet, but might bother some people.
Any smells from the unit:	No
Any other observations or mechanical issues:	Some coffee grounds get scattered around the machine from regular use.
Does the unit hold about the right amount for your needs, too little, or too much:	The small volume works well for small offices, small households, or classroom demonstration. Notes that for large families or groups it may be too small.
What is done with finished product:	Added to outdoor garden beds.
Satisfaction with the unit, 1 (low) to 5 (high):	5
Would you recommend a unit to people living in apartments:	Yes
Would you recommend a unit to offices with breakrooms:	Yes
Would you recommend a unit to anyone else:	People who want to compost while camping or travelling in an RV
Other comments:	No

Interviewed:	Household (2 people)
What kind of unit:	Vitamix Foodcycler
How long have you had it:	Had first Foodcycler for 3 years until it broke. Got a second one, used it ~2 years until green cart program started.
Why did you decide to get a countertop composter?	Work in the solid waste industry. Interested in testing electric composters as another potential option for residents. Also noted electric composter felt more "contemporary" and modern than a backyard compost bin.
Have you tried other compost or organic waste methods?	Green cart collection, backyard compost bin.
Feelings on time spent loading/emptying/using the unit:	Minimal
Any noises from the unit:	Moderate white noise, similar to dishwasher. Can also hear it when grinding; occasional loud sound. Kept in a separate room.
Any smells from the unit:	Yes, but not offensive. Notes they did not change the filter more than once a year.
Any other observations or mechanical issues:	No
Does the unit hold about the right amount for your needs, too little, or too much:	Exactly right amount
What is done with finished product:	Add it to outdoor compost bin in summer or add it directly to outdoor garden soil.
Satisfaction with the unit, 1 (low) to 5 (high):	4
Would you recommend a unit to people living in apartments:	Yes if they don't have a green cart.
Would you recommend a unit to offices with breakrooms:	Yes but only if there is enough oversight to make sure it is being used correctly.
Would you recommend a unit to anyone else:	Potentially for small communities where it isn't economical to have a green cart program.
Other comments:	No.

Interviewed:	Household (2 people)
What kind of unit:	Vitamix Foodcycler FC-50
How long have you had it:	2 months
Why did you decide to get a countertop composter?	Wanted to try it to help garden soil and avoid throwing away food waste. Also glad to avoid the pest concerns from a traditional outdoor bin.
Have you tried other compost or organic waste methods?	No
Feelings on time spent loading/emptying/using the unit:	Minimal, it is easy to use
Any noises from the unit:	Yes it's a little noisy, especially during the grinding stage.
Any smells from the unit:	No, the lid for the bucket worked well
Any other observations or mechanical issues:	No
Does the unit hold about the right amount for your needs, too little, or too much:	Right amount
What is done with finished product:	Added to garden soil
Satisfaction with the unit, 1 (low) to 5 (high):	4
Would you recommend a unit to people living in apartments:	Yes definitely
Would you recommend a unit to offices with breakrooms:	Unsure
Would you recommend a unit to anyone else:	Unsure
Other comments:	It is pretty expensive!

Interviewed:	Household (4 people)
What kind of unit:	Pela Lomi
How long have you had it:	1 year
Why did you decide to get a countertop composter?	Received it as a gift. They do a lot of cooking with fruits and veggies, and have a large garden, but no green cart program (at the time).
Have you tried other compost or organic waste methods?	Have used a backyard compost bin most of their life. Also recently got a green cart.
Feelings on time spent loading/emptying/using the unit:	Minimal and fun. Keep the container on the counter and run it every 1-2 days.
Any noises from the unit:	Some noise but nothing obtrusive. Unit kept in the laundry room, no louder than dryer.
Any smells from the unit:	Has a noticeable smell when running. Not a rotting smell—a food or chemical smell.
Any other observations or mechanical issues:	Occasionally the unit seems to get stuck in a cycle and not shut off. Fixes this by unplugging and replugging machine.
Does the unit hold about the right amount for your needs, too little, or too much:	Exactly the right size.
What is done with finished product:	Stored in large container and then added to outdoor garden bed. Noticed a big improvement in soil fertility after using it for a year.
Satisfaction with the unit, 1 (low) to 5 (high):	5
Would you recommend a unit to people living in apartments:	Yes definitely
Would you recommend a unit to offices with breakrooms:	No, would not trust office workers to consistently run and take care of it
Would you recommend a unit to anyone else:	"I think that anyone who actually wants to compost should have one." Noted that they could potentially be leased by a parent company rather than purchased outright.
Other comments:	Electric composters are great for educating kids about organic waste.



Interviewed:	Household (2 people)
What kind of unit:	Pela Lomi
How long have you had it:	2 weeks
Why did you decide to get a countertop composter?	To reduce their household's carbon footprint from organic waste and to use the material in a garden. Didn't want to do a compost method that would make the apartment smelly.
Have you tried other compost or organic waste methods?	No
Feelings on time spent loading/emptying/using the unit:	Moderate but worthwhile
Any noises from the unit:	Fibrous veggies make a lot of grinding noises.
Any smells from the unit:	No
Any other observations or mechanical issues:	Does not actually break compostable plastic down very well, in spite of manual saying it would.
Does the unit hold about the right amount for your needs, too little, or too much:	About the right amount for them. Noted that gardeners who need more compost would find it too small.
What is done with finished product:	Added to garden bed.
Satisfaction with the unit, 1 (low) to 5 (high):	4
Would you recommend a unit to people living in apartments:	Maybe, although they would have less use for the finished material.
Would you recommend a unit to offices with breakrooms:	Maybe, although they would have less use for the finished material.
Would you recommend a unit to anyone else:	Anyone with a small garden.
Other comments:	No.

Interviewed:	Household (2 people)
What kind of unit:	Pela Lomi
How long have you had it:	2 years
Why did you decide to get a countertop composter?	Wanted to keep kitchen scraps out of the garbage and out of the landfill, but also wanted something easy and not smelly.
Have you tried other compost or organic waste methods?	No
Feelings on time spent loading/emptying/using the unit:	Very easy
Any noises from the unit:	Not usually, although some loads making "creaking" noises during grinding.
Any smells from the unit:	Not while running. Finished material smells like roasted coffee and vegetables.
Any other observations or mechanical issues:	No
Does the unit hold about the right amount for your needs, too little, or too much:	About right, maybe a little bit too much. They don't have enough food waste to totally fill up the bucket before they have to run it so it doesn't get too old.
What is done with finished product:	Stored in a large container and given away to a gardening friend.
Satisfaction with the unit, 1 (low) to 5 (high):	5
Would you recommend a unit to people living in apartments:	Yes definitely
Would you recommend a unit to offices with breakrooms:	Yes probably
Would you recommend a unit to anyone else:	Anyone who wants to compost inside
Other comments:	Usually just runs the machine on the default setting. Hasn't used the slower "grow mode."

Interviewed:	Household (4 people)
What kind of unit:	Pela Lomi
How long have you had it:	Had first Lomi for 1 year until it broke. It was replaced for free under warranty; have been using the second one for 1 year.
Why did you decide to get a countertop composter?	Strongly disliked the experience of backyard composting, found it unpleasant smelling. Decided to try something else.
Have you tried other compost or organic waste methods?	Backyard compost bin.
Feelings on time spent loading/emptying/using the unit:	Minimal
Any noises from the unit:	Somewhat loud while running, more than a dishwasher.
Any smells from the unit:	Yes if the carbon filter has not been changed for a few months. Otherwise only mild baking smell.
Any other observations or mechanical issues:	No
Does the unit hold about the right amount for your needs, too little, or too much:	About the right amount. Run it every 1-2 days.
What is done with finished product:	Add it to outdoor garden bed.
Satisfaction with the unit, 1 (low) to 5 (high):	4
Would you recommend a unit to people living in apartments:	Yes
Would you recommend a unit to offices with breakrooms:	Yes
Would you recommend a unit to anyone else:	Yes, anyone interested could try one.
Other comments:	Wonders how much power it uses.