UBC Social Ecological Economic Development Studies (SEEDS) Student Report

# Increasing Education, Awareness, Participation and Effectiveness In Composting on Campus

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# Increasing Education, Awareness, Participation and Effectiveness In Composting on Campus
## Scenario 7

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**Abstract**

UBC Waste Management (UBCWM) continues to struggle with promoting awareness of the composting program at UBC, as well as preventing contamination of the compost bins. Our report focused on the Student Union Building (SUB), as the SUB is a highly frequented area, and serves as a microcosm of the larger campus. This report attempts to address the reason for the issues surrounding composting, as well as provide some recommendations towards improving the current program, through investigating a paper towel composting program and devising more effective signage. Background research included previous AGSC 450 UBCFSP reports and the Sauder Social Marketing Plan for UBC Food Services. Our team visually assessed the composting bins and signs in the SUB, before holding a meeting with Nadine Stunzi of UBCWM. Focus groups were then conducted, to determine the current level of compost awareness, and discuss attributes of effective signs. To investigate existing paper towel composting programs, phone interviews were performed with four Canadian institutions. Research revealed that students are unaware of composting at UBC, and that current marketing tools to promote awareness are not effective. The main issues discussed in the focus groups were a lack of education and a need for clearer signs addressing contamination issues. Implementation of a paper towel composting program has been greatly successful at other institutions, but has potential to upset the carbon:nitrogen ratio of UBC compost if food waste does not increase correspondingly. Before food waste can be increased, it is critical to address the issue of contamination. This can be approached by adopting a uniform, invariable sign program at all food venues, possessing effective characteristics as identified by our focus groups.

**Introduction**

The UBC Food System Project (UBCFSP) aims to address the larger disconnection between our society and food by looking at UBC as a model for communities in general. The UBCFSP, through collaborative community-based action research, aims to create a closed-loop, sustainable food and waste system at UBC. This system attempts to minimize waste production and divert waste streams from the landfill back into the campus as useable resources, while utilizing as many local, on-site resources as possible. Key stakeholders and partners involved in the UBCFSP include UBC Food Services (UBCFS), AMS Food and Beverage Department (AMSFBD), UBC Waste Management (UBCWM), Sauder School of Business classes, and the Faculty of Land and Food Systems.

Students in the Agricultural Sciences 450 program were provided a series of scenarios focusing on different aspects of the UBCFSP. This paper investigates Scenario 7, which addresses education, awareness, participation and effectiveness in composting on the UBC campus. A well-run composting program can effectively divert food waste from the landfill and provide nutrients for

other food-producing plants. This can only be realized, on the UBC campus and in the greater community, if all participants are aware of the benefits of composting, are provided with easy access to compost collection centers, and are educated as to the propensity of specific objects to break down. Nadine Stunzi, the Student Coordinator for UBCWM, outlined the five most important issues that need to be addressed in order to improve composting at UBC. These issues included: assessing and improving the Get Caught Composting campaign, composting outreach to the student body, compost and contamination outreach and awareness, addressing composting in student residence, and interactive outreach and sustainability events. Our group decided to focus on increasing awareness and reducing contamination.

**Problem Definition**

The UBC in-vessel composting facility has been in operation on the South Campus of the university since 2004. This machine has the capability to compost up to fives tonnes of pre and post-consumer organic waste each day, converting it to useable topsoil for use on the UBC campus or UBC Farm, however, current compost levels do not reflect its full operational capacity. While there is potential for 70% of the UBC waste stream to be diverted from the landfill, for the past few years, only 46% of the waste was being composted or recycled (UBCWM 2004). Furthermore, despite efforts by UBCWM to address contamination, the production of a high quality final product has been compromised by non-compostable materials. Items such as Styrofoam containers, chopsticks and metal/plastic cutlery increase the risk of damage to the in-vessel and decrease the quality of the composted product. Lack of knowledge regarding compostable materials is a significant barrier to creating an efficient and sustainable composting system. Logically, reducing contamination at the consumer level is crucial in addressing this issue. Though UBCWM may be interested in composting other sources of organic waste such as paper towels, increasing the quality and yields of compost will be required before other compost streams can be implemented.

The purpose of this report is to highlight existing challenges and successes within the current composting system at UBC and propose recommendations to promote a sustainable composting program. A successful compost system at UBC could serve to demonstrate the potential for more sustainable waste stream diversion within the broader food system.

After reviewing past research and critically analyzing the current composting program at UBC, our group decided to focus our attention on the Student Union Building (SUB). We feel that the SUB represents a microcosm within the larger university community. In order to improve awareness and decrease contamination of the composting system in the SUB, our group first assessed past research on the composting program, and the present compost situation in the SUB. We decided to approach the problem from two complementary angles. Firstly, we felt we needed to address contamination by improving signage on the existing compost bins. Secondly, our scenario group decided to investigate the feasibility of introducing a paper towel compost program within the Student Union Building.

Our group felt that diverting paper towel waste from the landfill to the compost system would benefit UBCWM's goal for a more sustainable campus in a number of ways. Firstly, paper towel composting in a high traffic area such as a washroom, would present another avenue to promote composting awareness. Secondly, paper towels represent a high volume source of waste; composting this waste would greatly reduce the total garbage output of the SUB. Finally, the high carbon content of the paper towel could balance the high nitrogen found in food waste, with the potential to increase the quality of the final compost product.

In this paper we will outline the steps our scenario group took to research and propose changes consistent with our two approaches to reduce contamination and introduce the composting of paper towels. Initially, group members reviewed past reports as well as the Sauder School of

business Compost Social Marketing Plan. We subsequently conducted a visual assessment of the SUB, networked with UBC Waste Management, and conducted focus groups with other students. Research also included phone interviews with individuals knowledgeable about paper towel composting programs, and a review of information on the carbon to nitrogen ratio in compost systems.

**Vision Statement and Value Assumptions**

In order to achieve a sustainable food production system the UBCFSP is guided by seven principles:

**1.** Food is locally grown, produced and processed.
**2.** Waste must be recycled or composted locally
**3.** Food is ethnically diverse, affordable, safe and nutritious
**4.** Providers and educators promote awareness among consumers about cultivation, processing, ingredients and nutrition
**5.** Food brings people together and enhances community
**6.** Is produced by socially, ecologically conscious producers
**7.** Providers and growers pay and receive fair prices

Our group comes from a diverse range of backgrounds including Dietetics, Agroecology, Nutritional Science, Food Market Analysis, GRS, and Food Science. Although we share a common vision of a waste-free UBC, we feel that the seven guiding principles for a sustainable UBC Food System do not currently address any policy changes and funding sources needed to create a successful sustainable system. In order for this initiative to be successful, we believe that policy changes and significant funding need to be in place before long term sustainability of the system can be achieved. Once policy and funding are implemented, we believe that this project will have the resources to move forward at a much faster pace. We strongly feel that the vision statement needs to be expanded to include an economic and policy component in order for this project to be seriously considered outside of UBC's Faculty of Land and Food Systems.

As students of the Faculty of Land and Food Systems, we are aware that the world around us is connected by the three pillars of sustainability: society, ecology, and economy. As a whole, our

group's paradigm is weak anthropocentric, meaning that we view and interpret our surroundings based on human experience and values, but still consider the values and interests of other organisms that share our environment. We identify with the three pillars of sustainability, yet are still influenced by the fact that we exist in a human-centered world. As the majority of UBC students do not receive as much exposure to the concepts of sustainability, we understand that a waste-free UBC may not be a priority for these students. Therefore, we feel that the implementation of the 7 guiding principles as well as future funding and policy changes should be introduced in small increments, to avoid overwhelming the general population at UBC.

## Methods:

### Review of 2006 reports

During our initial meetings, individual group members selected a past report from 2006 to review. Each report was summarized and shared with the rest of the team. Key points were highlighted and discussed in order to fully understand the problems at hand and ensure that further research would build on current knowledge and past efforts.

### Compost Social Marketing Plan for UBC Food Services

To further our understanding of the problem presented, our group consulted the "Compost Social Marketing Plan for UBC Food Services," a marketing report conducted by the Sauder School of Business Commerce 468 students. After careful examination of the report and its recommendations, our group identified that the commerce students had focused mainly on the marketing of the message of the overall UBC composting program. The report did not address the issue of improving signage to reduce contamination. For this reason, our group decided to carry out our own focus group discussions to investigate the effectiveness of current signage to reduce contamination.

**Visual assessment of the Student Union Building**

After our group had selected the Student Union Building (SUB) because of its high-traffic location, we decided to conduct a visual assessment of the building. Several members of the group met at the SUB to tally the number of composting stations within the building, and note their location. Photographs were taken of each station, as well as its accompanying signage.

**UBC Waste Management (UBCWM) Consultation**

As our group performed background literature research and began to streamline the focus of our paper, we found we had several questions about composting; both general and specific to UBC. To address this issue, we kept a working list of questions that we continued to tailor as our research progressed. We delegated a group member to set up a meeting with Nadine Stunzi, the Student Coordinator for UBCWM. The entire group met with Nadine on March 14, 2007 to discuss our project focus, and to clarify our questions regarding composting (see Appendix I). Throughout the discussion, Nadine devised a list of questions that she was unable to answer directly without first consulting her supervisor. We then communicated with Nadine via email to follow up on these unanswered questions.

**Focus groups**

We took a Community Based Action Research approach to our focus groups. This approach enabled students from the UBC community to participate in the empowering process of contributing to the creation of a more sustainable campus. Focus groups were primarily used to determine the effectiveness of current compost signs in reducing contamination. However, students were also asked to discuss the issues surrounding contamination and ways to address these issues. The focus groups were composed of UBC students, which were selected by convenience sampling through e-mail, flyers, and in-person recruiting. Convenience sampling was chosen, as this was the easiest way to ensure participation and involve interested students.

Three, 45-minute focus group sessions took place between 12:00pm and 3:00pm on the main floor of the Angus building on the UBC campus. In order to assess the current level of knowledge regarding composting at UBC, particularly in the Student Union Building (SUB), a brief questionnaire was administered by our scenario group to the focus group participants at the beginning of each focus group (see Appendix V). Two members of our group then led a brief presentation to provide background knowledge on the current composting system at UBC. Focus group participants were asked to analyze six current signs used in the UBC composting program through powerpoint photos. They were asked to first discuss the pros and cons of current signs, and then suggest improvements to increase the efficacy of the signs in reducing contamination (see Appendix III). To determine what components students believed were most important in a composting sign, focus group participants were also asked to draw and describe their version of an "ideal" sign (see Appendix IV). Students were also asked to discuss the idea of composting used paper towels to determine the likelihood that this program would be successful in the future.

**Phone interviews towards implementing a paper towel composting program**

In order to assess whether or not it would be possible to implement a paper towel composting program in the SUB, we researched institutions in Canada which already have successfully implemented paper towel composting programs. These included Parliament Hill, Whistler/Blackcomb, Acadia University and International House at UBC. These institutions were contacted through email to schedule telephone interviews. A set of questions were prepared for the telephone interviews for each Institute (see Appendix II).

**Paper towel as a biohazard**

Originally the group had hoped to set up some trial paper towel compost bins in the SUB washrooms to evaluate levels of compliance by students, as well as to monitor types and amounts of contamination that could be expected for this initiative. However**,** the group was initially informed

by a UBCWM employee that UBC does not allow the composting of washroom paper towels for hygienic reasons. The group decided to research UBCWM documents to determine the reasons for preventing paper towel composting. In addition we investigated scholarly literature in order to determine any potential bio-security issues with the composting of paper towels.

**Carbon nitrogen ratio**

Nadine Stunzi of UBCWM was concerned that the future implementation of a paper towel composting program may result in a chemical imbalance in the final compost product, if food waste volume did not increase correspondingly. A group member investigated this topic further by consulting composting information from the BC Ministry of Agriculture, Food and Fisheries.

## Findings and Discussion:

**Review of 2006 reports**

*Findings:*

Last year, four reports were written to address composting at UBC. The first proposed a "Get Caught Composting" campaign, designed based on the philosophies of community-based social marketing. The aim of this campaign was to increase student awareness and participation in composting initiatives. The second report discussed methods of increasing awareness of the importance of composting to students living in Gage residence. In the third report, students created a new composting brochure aimed at increasing awareness of the importance of composting. The final report addressed awareness and participation in composting on campus by designing marketing and educational materials. This group proposed that future AGSC 450 groups run focus groups to get input and ideas regarding composting from UBC students outside the faculty. Additionally, this group proposed that research should be done to determine the feasibility of incorporating paper towels from washrooms into the composting program.

**Compost Social Marketing Plan for UBC Food Services**

*Findings:*

According to the report, a low level of awareness of the UBC Composting program exists among campus users. Additionally, knowledge regarding the concept of composting is modest at best. This lack of knowledge translates to a low level of participation in the program, as well as contamination in compost bins and composting facilities. The report clearly shows that the UBC Composting program does not understand their audience and lacks proper marketing planning. It also showed that current marketing tools are unable to reach students in a meaningful way, as few students claimed that they had seen the composting posters on campus.

**Visual assessment of the Student Union Building**

*Findings:*

Within the upstairs cafeteria seating area, six composting stations were found. Some contamination within the bins was noted, such as Styrofoam food containers, wooden chopsticks, and plastic drink lids. Photos of the signs above the sort stations can be found in Appendix III.

One compost sort station is located in the basement level of the SUB, outside the men's and women's washrooms. This sort station was accompanied by a tray of plastinated food items, which is meant to serve as a visual aid to assist in waste sorting. Photographs of the tray can be found in Appendix III. One organics composting green bin was discovered in the basement level of the SUB, outside the Pit Pub.

**UBCWM Consultation**

*Findings:*

Overall, it was found that many of the barriers that faces UBCWM, and in turn composting efforts across campus, are due to a lack of monetary resources designated to their efforts. Additionally, it is difficult to coordinate different bodies within the university to achieve a common

objective, in this case an effective composting program. UBCWM has often run into conflict with custodial staff who claim that dealing with compost waste is not in their job description. This may be avoided in the case of paper towel compost by recruiting a volunteer or "Sustainability Coordinator" within the SUB to empty paper towel bins on the days that Plant Operations pick up other organic waste. There is also a lack of coordination between the Alma Mater Society (AMS) and UBC Food Services (UBCFS) in their efforts to promote composting in the SUB. Future efforts to encourage a partnership between the AMS and UBCFS will greatly improve the ability of the SUB to promote awareness regarding composting.

**Focus Groups**

*Findings:*

The focus groups demonstrated that there is still a lack of awareness of the compost program at UBC, particularly regarding access to compost sites, and understanding of the composting process. Students agreed that there is a need for clearer signs which also provide incentives such as social, economic and environmental reasons to participate in the composting program. The focus group participants also addressed certain barriers to composting such as providing too many garbage cans in the SUB and providing insufficient education to the students. The students were enthusiastic about beginning a paper towel composting program but were concerned about funding.

A summary of the responses to the initial questionnaire can be found in Appendix V and the key aspects of an "ideal" composting sign can be found in Appendix IV. The summary of discussion questions addressing the current composting signs, the issues regarding contamination of the compost bins, and the concept of a paper towel-composting program is provided in Appendix III.

*Discussion:*

The focus group questionnaire revealed that current knowledge regarding composting at UBC, particularly in the SUB, is very minimal. Though the majority of students visit the SUB

throughout the school year, almost half of the students in the focus groups did not know that composting bins were available in the SUB. In terms of what can and cannot be composted, many students were unaware that all food waste can be composted. Many students were also not aware that paper plates/cups and napkins can be composted and that treated wood such as chopsticks cannot be broken down in UBC's composting in-vessel.

The students' versions of an ideal composting sign had many similarities. Students agreed that the design and title should be simple and catchy. The majority of students believed that simple slogans would grab attention. Most students emphasized that a checklist was needed on the sign to identify items that can and cannot be composted, along with pictures of these items. Many students also agreed that incentives towards composting were needed, such as informing students that compost diverts food waste from the landfills and can be converted to soil to be used on the UBC campus.

The critique of the current signs helped to identify the key qualities necessary for an effective composting sign. Students focused on having a sign with good spacing of text and pictures with a simple colour scheme. They emphasized the need for legible font, as well as relevant and recognizable pictures that represent composting. Students liked the use of red "stop" and green "go" colors to indicate which items could and could not be composted. All students agreed that a clear list of compostable and non-compostable items were needed. Students believed the title was an important aspect towards grabbing attention. Most students agreed that the title should not use scientific jargon but still emphasize the preservation of the environment. For example, some students believed the word "organic" was too political or scientific, whereas others believed "organic" symbolized environmental concern. Most students felt the word "compost" was useful in the title, but some worried that not all students are familiar with composting, particularly International students, where composting may not be common in their country. Many students also believed that it was

important to indicate on the sign the importance of composting and how their food waste would be used.

The students' identification of the problems with the current composting system, as well as suggestions for improvement, was useful in determining current aspects of the composting system which required change. Students agreed that garbage cans beside the cafeteria sorting stations should be eliminated to force students to use the sorting stations. They also emphasized the current lack of knowledge regarding composting and the need for student education. The students believed that composting could be encouraged through awareness events and the use of one consistent campus-wide sign which emphasizes the relevance of composting. To decrease contamination, students believed that signs should clearly list the most common sources of contamination. However, students also believed that waste management would ultimately have to invest in a better method of waste sorting, as contamination could never be completely eliminated.

In terms of composting paper towels in the bathrooms, most students believed this was an excellent idea that should be implemented, as risk for contamination would be low. However, some students were concerned about the additional costs required for pick-up and the bins. One student was also concerned that paper composting would have to be done on a large scale basis in order for students and faculty members to become accustomed to the bins. This was of concern to our group, as we know that paper towel composting would need to be implemented slowly in order to ensure that the quality of compost was not diminished.

**Paper towel as a Biohazard**

*Findings:*

Group members were unable to find any documentation from UBCWM stating that washroom paper towel is prohibited from being composted for hygienic reasons. We did however

come across many documents, including the UBC In-vessel Brochure (UBC Waste Management, 2005), and the UBC Calendar (UBC Student Services, 2007), encouraging the composting of paper towel on campus.

No scientific studies could be located that specifically focused on the composting of washroom paper towel. It was noted in one study that the bio-security of composting is a topic with a need for much more research. It did become clear while reading various articles however, that composting is a very well known method of pathogen elimination. Almost all known pathogenic bacteria, viruses, protozoa and fungi are susceptible to the high temperatures that are reached for extended time periods during the composting process. This is especially true within an in-vessel. A couple of known exceptions are endospore forming bacteria such as *Bacillus anthracis* which causes Anthrax, and prions (Wilkinson, 2007). There was also some literature on the use of in-vessel composting being successfully used to deal with large amounts of bird carcasses on farms during the A1 (H7N2) avian influenza outbreaks. The virus in these cases was eliminated from the farms within 14 days using in-vessel composting (Wilkinson, 2007)

Maintaining these high temperatures for extended periods of time is known as the 'time-temperature effect'; this effect plays a key role in pathogen destruction during composting. The time-temperature effect is what is used in many cases to destroy pathogenic bacteria during food pasteurization and sterilization, rendering food products safe for consumption (Angelotti, 1961). Other factors that inactivate pathogens during composting include organic acid and ammonia production, as well as microbial antagonism, where some microbes actively kill others (Wilkinson, 2007). There are multiple methods available for effectively testing the bio-security of compost (Christensen, 2002), but it is unclear what methods UBC currently employs.

*Discussion:*

Paper towel from the washroom will contain some pathogenic bacteria. This is because it is used in the final stages of hand washing, where its role is to both dry hands as well as physically slough off up to 58% of remaining microbes loosened up by the soap and water (H.W.F.L, 2006). It is exposed to the air in a washroom giving it yet another opportunity to collect pathogens. However, it is also true that the discarded food products that have been resting at room temperature for a day in compost bins will also contain pathogens. In-vessel composting is known to be able to successfully eliminate pathogens. The fact that in-vessels have been used successfully in eliminating the A1 (H7N2) virus in the bird flu scares shows to what scale the capabilities of such a system are. For these reasons it does not make sense for UBC to prohibit paper towel composting based on hygiene reasons; clearly in-vessels are able to handle much larger scale pathogen loads than will be present on paper towel.

It would stand to reason that paper towel should be dealt with in an in-vessel environment where the pathogens will be exposed to the high temperatures, organic acids and microbial antagonism, as opposed to a landfill environment where the pathogens will be provided with ample opportunity to multiply.

**Phone interviews towards implementing a paper towel composting program**

*Findings:*

The four Canadian institutions have effectively implemented paper towel composting programs. The paper towel composting programs at these institutions have been running for varying lengths of time, from only one month in one case to seven years in another. All institutions however, have noticed excellent compliance and success in their composting programs.

*Discussion:*

All four institutions were encouraging and enthusiastic about our project to incorporate paper towel composting in the SUB at UBC. Each institution shared valuable lessons which are important to incorporate when initiating an on-campus paper towel composting program. Firstly, all institutions emphasized the importance of having the maintenance staff on board in the project, as they are in control of sorting the waste. It is important to ensure that the waste removal staff are equipped to deal with the added work of composting paper towel. Secondly, the importance of communication with all stakeholders including but not limited to: waste management, waste removal contractor, and those who will be using the washrooms, was emphasized. Thirdly, it is important to conduct a survey of how many washrooms will be involved, the frequency of washroom staff emptying waste bins, amount of extra time involved, and the projected cost of the program. Fourthly, as long as an easily understood sign such as 'Paper Towel Only' is provided, along with a smaller can for garbage items, contamination did not appear to be a problem. Lastly, in most cases there only appears to be a minimal cost associated with paper towel composting, which includes the initial costs of providing composting bins and signs in the washrooms. The University of Acadia has also shown that government policy greatly influences university policy as recycling has been made mandatory by the government of Nova Scotia. This has greatly influenced the University of Acadia to adopt environmental policies.

**Carbon Nitrogen Ratio**

*Findings:*

We found that carbon and nitrogen are the two most important compounds to consider when creating compost (BCMAFF, 1998). Composting relies on the action of microorganisms to break down organic matter; these organisms utilize carbon as an energy source, and nitrogen to synthesize proteins and enzymes (BCMAFF, 1998). Failing to ensure that a compost system has an adequate

carbon to nitrogen ratio can limit the activity of the microorganisms, resulting in an inefficient compost system (BCMAFF, 1998).

A healthy and efficient compost system should have a C:N ratio ranging between 25:1 and 40:1 (BCMAFF, 1998). Finished compost typically has a neutral pH, and a C:N ratio of approximately 20:1 (BCMAFF, 1998).

To maintain ideal microbial conditions at an appropriate C:N ratio, the compost coordinator must understand that the materials placed into the initial compost pile differ in their carbon and nitrogen content. Materials such as vegetable wastes are very high in nitrogen, typically having a C:N ratio value between 12:1 and 20:1 (BCMAFF, 1998). Dry, wood-based products have very high C:N ratios; the C:N ratio of paper is between 150:1 and 200:1 (BCMAFF, 1998). Implementing the paper towel collection program in the washrooms of the SUB before increasing the volume of uncontaminated food waste could result in a high carbon content which would disrupt the ideal C:N balance of the compost. Continued effort should be made to reduce contamination of all kinds, including plastics and metals. Contamination in the form of heavy metals such as manganese, copper, zinc, nickel, chromium, and lead is toxic to the microorganisms that the compost process depends on (BCMAFF, 1998).

*Discussion:*

Without knowing the moisture content of all the materials entering the compost system, it can be extremely difficult to establish the proper C:N balance and estimate the exact C:N ratio of the finished product. The BC Agricultural Composting Handbook, published by the BC Ministry of Agriculture, Food and Fisheries (1998), provides more information on the proper mixing of composting ingredients. It includes C:N ratios, moisture content, and densities for typical compostable materials, as well as formulas to help calculate the best blend of materials.

**Possible Recommendations**

Through our conversation with Nadine Stunzi, we acknowledge that funding of the waste management department is a major barrier to overcome in implementing any recommendations for change in the UBC compost program. Therefore, our recommendations should be implemented based on a "funds available" basis. If UBC is truly committed to becoming a sustainable campus, with closed food and waste loops, the university must seriously consider allocating more funds to waste management efforts. Our recommendations have been directed to two categories: future AGSC UBCFSP collaborators and UBC Food Services and Waste Management.

**Recommendations for future AGSC UBCFSP collaborators:**

- Continue to improve composting education/awareness events
- Work with UBC Food Services to create consistent campus wide composting signs (focusing on contamination specific signage). Refer to Appendix IV for attributes of an effective composting sign.
- Research types of pre-sorting machinery available for in-vessel composting
    - Include research of new avenues to increase funding and manpower
- Determine the feasibility of implementing a trial run paper towel composting program in the washrooms of the SUB
- Develop a program to educate and involve maintenance staff in composting programs
- Advocate the importance of creating policy and increasing resources to authority figures

**Recommendations for UBC Food Services and Waste Management:**

- Eliminate garbage cans beside composting bins
- Increase prevalence of contamination-specific signage
- Increase the number of composting stations throughout the SUB
- Determine the willingness of custodial staff in becoming involved in paper towel composting in washrooms
- Implement pre-sort procedures for the in-vessel
- Audit the amount of paper towels currently being directed to landfills

**Final conclusion**

Through our focus group findings and previous research, our team has concluded that there is an appalling lack of knowledge regarding awareness and permitted items in the compost system at UBC. This lack of knowledge is even rife within the faculty of Land and Food Systems, as we discovered during our group presentation; many students, including a member of the teaching team,

were under the belief that chopsticks were compostable, while hamburgers were not. UBC has made a significant investment in building an in-vessel composter. While this is an excellent step towards the creation of a more sustainable campus it has become evident that more resources need to be invested into awareness and contamination in order to create an effective composting system. We believe by following some of the recommendations stated in this paper especially advocating for increased resources and effective signage that targets specific contamination items, the composting program at UBC could reach its full potential.

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**Appendix I**
Questions for UBC Waste Management

1) What are the most common contaminants in the compost bins?
    a. Chopsticks (treated wood)
    b. Sushi containers
    c. Coffee cup lids
    d. Cutlery
    e. "Chain effect" → one person composting incorrectly often leads to many people following incorrectly.
    f. Many people are unaware of contaminants, but also of materials that the UBC in-vessel can compost. (ie. meat, dairy, paper plates)

2) What might be the main reasons for contamination of the compost bins?
    a. Lack of awareness and education
    b. Carelessness
    c. Accident
    d. Convenience of garbage bins

3) What measures are in place to reduce contamination?
    a. Person stands on conveyer belt as waste goes into in-vessel and picks through waste for contaminants.
    b. Pin in the machine to stop it if a contaminant jams the mechanism. Dangerous because someone must climb in the in-vessel to retrieve contaminant.

4) What are future plans for reducing contamination?
    a. A screen to sift through the end product → very expensive

5) How often are the waste bins in the washrooms emptied?
    a. Tuesdays and Fridays, 15 green organic bins emptied

6) How much would it cost to install the green composting bins in the washrooms for paper towel? How much do the stand alone green bins cost?
    a. Answer obtained from International House contact: Jason Currier Approx $80.

7) What barriers are there towards recycling the washroom paper towels?
    a. Policy

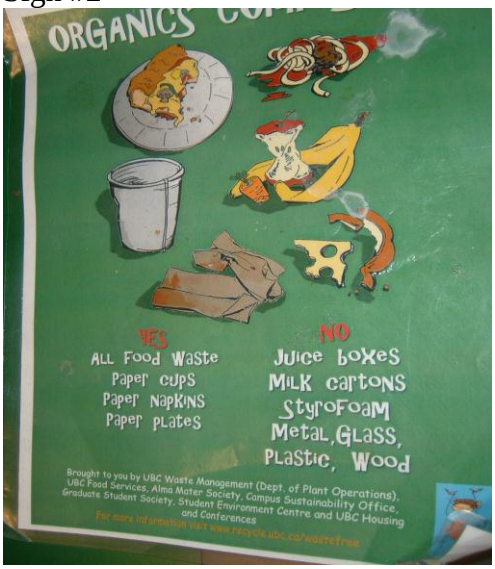
**Appendix II**
Questions for Institutions Already Composting Paper Towel

1.) How was the program initiated?
2.) Were there any barriers upon implementation? If so, how did you address them?
3.) What were the costs of starting up the program?
4.) What are the operational costs?
5.) How did you educate the public about your program?
6.) What kind of signs did you use? What was effective? What was ineffective?
7.) What are the benefits of the program?
8.) Do you have any papers, reports, statistics or other information you could send us?

**Appendix III**
Focus Group Sign Assessment

Sign #1


Sign #2




Sign #3


Sign #4


Sign #5


Sign #6

| Sign | Positive Aspects | Negative Aspects | Suggestions for Improvement |
|---|---|---|---|
| #1 | - Checklist is effective<br>- Distinguishes UBC compost system from backyard composting<br>- Differentiates what can and cannot be composted with use of "stop" (red) and "go" (green) colours.<br>- Effective logo: circular compost symbol with recycling arrows | - Font is too goofy, messy and childish<br>- Words on poster are crowded<br>- Overall, sign is complicated:<br>eg. Who is "we" in "we compost"?<br>- Monkey is too large and demands too much attention (students do not know the connection between the monkey and composting)<br>- Photo of in-vessel composter is unnecessary, difficult to identify and confuses the students<br>- The in-vessel composter and monkey are distracting from the message to compost. | - Use a larger, simpler font<br>- Eliminate picture of in-vessel composter<br>- Remove or reduce size of monkey<br>- Use a picture that better connects to composting<br>- Enlarge logo |
| #2 | -Visually appealing format<br>- Effective pictures and checklist<br>- Eye-catching, gets students thinking about compostable items<br>-Good use of spacing, with distinct lists of what you can and cannot compost<br>- The word "Organic" symbolizes a connection to the environment | - Confusing because pictures are all of items that can be composted, but list divides items into what can and cannot be composted<br>- Title may turn some people away – "Organic" seen by some as a political statement<br>- Font inconsistent, hard to read and is gimmicky<br>- Too much information about sponsors<br>- Illustration of cup is be confusing – could be paper or plastic<br>- Nothing on the sign is really attention grabbing | - Include pictures of compostable and non-compostable items above each list<br>- Change font and layout<br>- Change title because the term "Organic" may deter or confuse some people.<br>- Simplify colors and clarify the sign. The bins are already colorful and if signs are to busy, it is overwhelming.<br>- Use compost symbol with arrows from sign #1 |
| #3 | - Would be useful as basic signs on green bins around campus<br>- Includes anything you've been eating<br>- Bold, succinct title<br>- Simple, no confusing pictures<br>- Clear font<br>- Would be especially effective in multiple bin sorting stations | - The background pictures don't jump out<br>- Dissent over title<br>- Some associate "Organic" with plants, other see the term as a political statement<br>- "Recycling" is confusing without explanation<br>- Only "Food Waste" is mentioned, doesn't include non-food items.<br>- Background pictures odd and distracting | - Identify location specific items such as chopsticks, sushi containers and coffee cups.<br>- Clearly list what items can and cannot be composted at UBC.<br>- Background pictures are not necessarily needed<br>- Title should be changed to "Waste Recycling"<br>- Avoid the term "Organic"<br>- More creativity needed |

| | | | |
|---|---|---|---|
| #4 | - Stop sign is effective<br>- Addresses everyone who throws garbage away<br>- Monkey both captures attention | - Font on bottom of poster too small<br>- Monkey distracts attention from message<br>- Felt sign was not effective<br>- Poor use of colour. Red background is overwhelming and words "composted" and "recycle" hard to read<br>- Sign too crowded and busy<br>- Word "Stop" has negative connotations<br>- Message confusing | - Increase font size and simplify.<br>- Arrows pointing to nearest compost bin are needed to guide eyes to bins<br>- List what can/cannot be composted on sign<br>- Suggested title: "Stop, garbage only" followed by small list of what is "garbage" and what is "compost"<br>- Reduce size of monkey<br>- Change background colour to white |
| #5 | - Good real-life example of compostable items<br>- Eye-catching<br>- Focuses on what people eat every day at the SUB. | - Tends to irritate people<br>  - Don't want to stop and look at tray<br>  - No sign accompany tray to say what it is.<br>  - Good idea, but doesn't effectively serve it's purpose<br>- Colours slightly confusing without labeling – some students might not make red/green connection to non compostable/compostable items initially<br>- Students may assume that everything on the tray can be composted<br>- Doesn't encourage composting<br>- Pictures are more effective than 3-D model | - Additional labeling to identify items and whether they can or cannot be composted<br>- YES and NO above the items on the tray<br>- Prop tray up instead of lying down – easier to see while walking past, looks less like an abandoned tray<br>-Use two trays: One red one for garbage items, and one green one for compost items.<br>- Have plastinated items on one half of tray, words to identify them on the other half. |
| #6 | - Gives sign a real world context by having plastinated waste along top<br>- Location specific items<br>- Bold, simple title<br>- Picture of soil and plant connects bin to the end product.<br>- Effective slogan at bottom of sign<br>- Appealing title: "Compost" vs. "Organic"<br>- Short and informative | - Sign itself fairly plain<br>- Broad categories result in people using their own discretion<br>- Connection to soil might be difficult for some students to make<br>- Clear message, but plastinated food is "kind of gross"<br>- Lacks a "No" section | - Include photos of people composting 'follow the crowd'<br>- Enlarge the catch phrase/slogan<br>- Briefly explain how compost is converted to soil<br>- Include information on where the compost is going, what it's used for, so students can see the benefits of "donating" their compost<br>  - eg. A comic strip |

**Additional Comments from Focus Group**

Barriers to Composting at UBC

- More garbage cans than compost bins results in an inconvenience to compost.
- Large garbage bins next to sorting stations results in a lower pressure to sort waste.
- Students are often in a rush and won't make the effort to sort their garbage.
- Lack of knowledge and awareness
- Students are still confused and hesitant about the multi-stream sorting areas.

Effective Ways to Encourage Students to Compost

- Include real numbers to show how much waste is diverted through the efforts of UBCWM
- Make signs specific to each location and have a uniform template for the entire campus
- Make composting more visible and convenient – posters in washroom stalls and have more bins etc
- Use composting as a solution to "reduce waste", place posters next to garbage bins
- Host composting parties to promote awareness and encourage participatory learning.
- Reduce size of garbage can openings so that students will have to sop and think about their waste
- Encourage awareness through word of mouth

Decreasing Contamination

- Use signs to detail can and cannot items: Target known problem items that cause confusion.
- Improved signage at compost stations
- Design a large sign with arrows and pictures lists of compostable and non compostable items.
- Use a marketing slogan
- Have volunteers/employees sort waste before dumping into in-vessel. Signs alone will not likely be enough to eliminate all contamination.

Increasing Awareness

- Pass out composting bookmarks (like the Koerner library man)
- Develop one, consistent campaign idea and style for all involved partners. Coordinate the different campus bodies who will be promoting composting. Students will make the connection all over campus.
- Encourage students to tell others about composting

Thoughts on Composting Used Paper Towels from Washrooms?

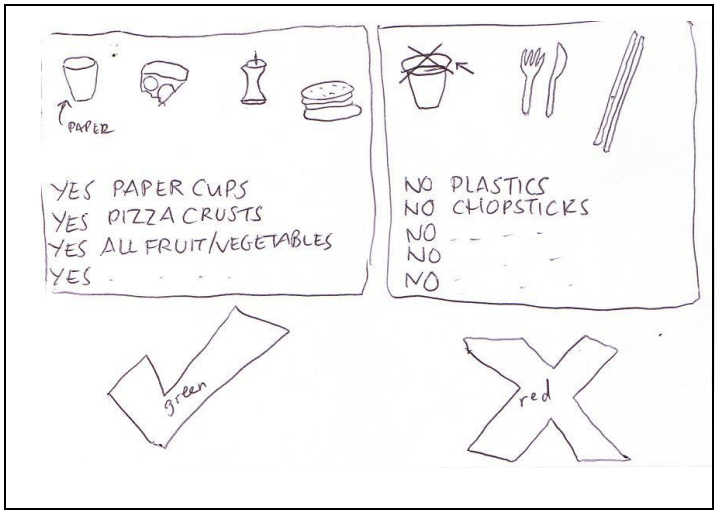
- Good idea because there are so many paper towels
- Sign – "Paper towels in here" with downwards pointing arrow
- Easy to sort garbage from paper towel bin so should have low incidence of contamination
- If a clear sign is used, it should be effective
- Put a smaller garbage bin next to recycle bin

Potential Barriers to Paper Towel Composting?

- Is there room for garbage bin?
- What is the cost of pick-up?
- Would have to be done on a large scale so people get used to doing it everywhere
- Would there be any politics surrounding program implementation?

**Appendix IV**
Characteristics of Ideal Signs, as Described by Focus Group Participants

| Design | Information |
|---|---|
| - Simple font<br>- Checklist format (checks and Xs)<br>- Pictures<br>- Use colour wisely<br>- Make the message memorable with a slogan.<br>- Arrows direct attention.<br>- Catchy heading: STOP and THINK<br>- Larger sign on one large bin.<br>- Simple design rather than overwhelming. | - Identify specific can/cannot items, rather than general categories.<br>- Emphasize that at UBC you can compost items that you can't at home.<br>- Include reasons why people should compost (ie. environment, UBC Farm).<br>- Emphasize waste not compost<br>- Scientific jargon (eg. "organic") is confusing<br>- Use incentives. |


"Ideal" signs designed by focus group participants

**Appendix V**
**Focus Group Questionnaire and Results**

**Welcome to the Composting Focus Group!**
Please place a checkmark next to the things that you can compost at UBC, through the in vessel composting program.

___ French Fries ___ Wooden chopsticks
___ Paper plates ___ Plastic sushi containers
___ Used napkins ___ Styrofoam food containers
___ Pizza crusts ___ Apple cores
___ Paper cups ___ Half of a hamburger with meat patty

1. Did you know that you can compost in the SUB?

2. Have you ever composted in the SUB? If so, do you compost regularly? If not, why?

3. Do you know where the compost locations in the SUB are? List any that you know of.

4. What faculty are you in? How many years have you been at UBC?

**Results:**

| Item | Yes | No |
|---|---|---|
| Wooden Chopsticks | 5 | 7 |
| Paper Plates | 8 | 4 |
| Used Napkins | 7 | 5 |
| Pizza Crusts | 9 | 3 |
| Plastic Sushi containers | | 12 |
| French Fries | 9 | 3 |
| Paper Cups | 7 | 5 |
| Styrofoam Food Containers | 1 | 11 |
| Apple Cores | 11 | 1 |
| Half of a hamburger, with meat patty | 9 | 3 |

Question 1:

| | |
|---|---|
| *Yes* | 7 |
| *No* | 5 |

Question 2:

| | |
|---|---|
| *Yes* | 5 |
| *No* | 7 |

Frequency ranged from as much as I can to never.
Those who did not compost in the SUB did not because it was inconvenient, they were not aware that composting was available in the SUB or because did not use the SUB.

Question 3:

| | |
|---|---|
| *Yes* | 7 |
| *No* | 5 |

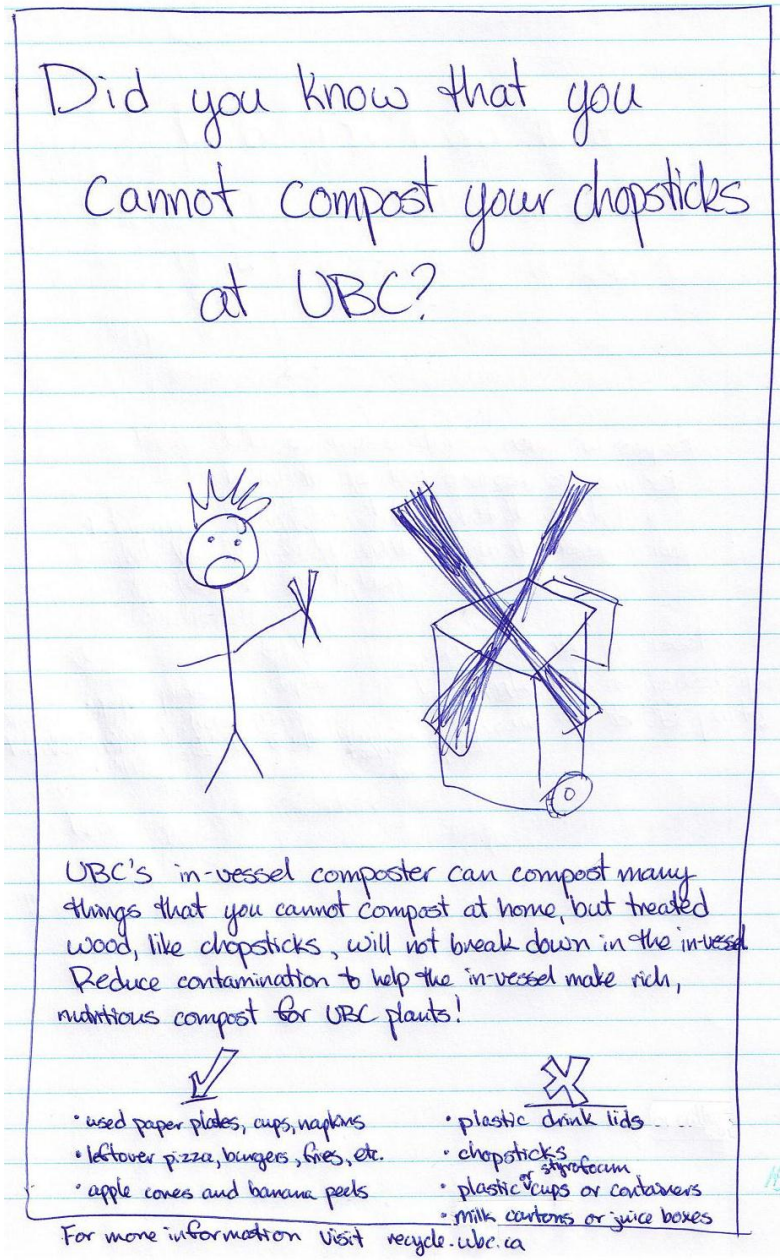
All locations were mentioned except the green composting bin outside the PIT in the bottom level of the SUB. Composting is available in the cafeteria on the main level of the SUB and downstairs in the basement of the SUB outside the washrooms.

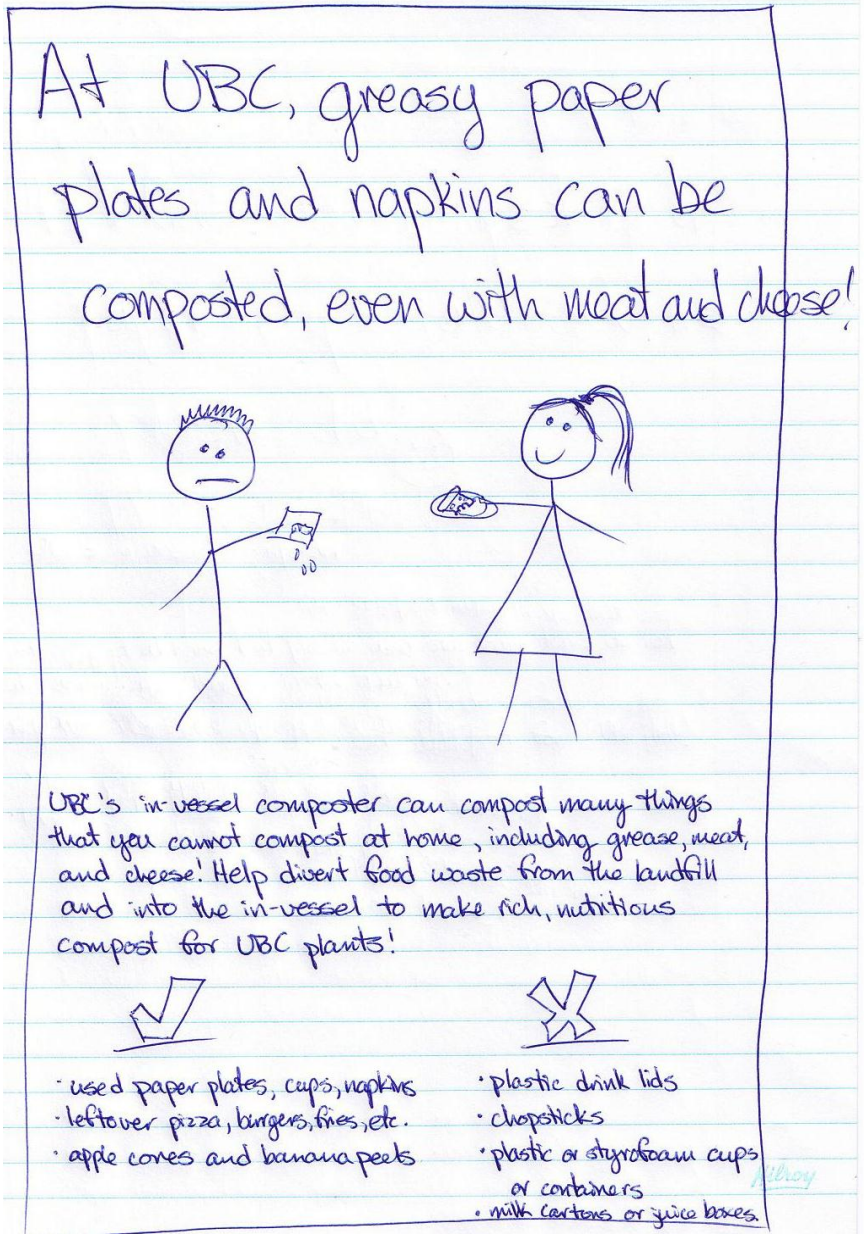
Question 4:

| Faculty | # of Years |
|---|---|
| Applied Science | 2 |
| Arts | 1 |
| Arts | 2 |
| Arts | 2 |
| Commerce | 4 |
| Computer Science | 4 |
| Graduate Studies | 5 |
| LFS | 1 |
| LFS | 3 |
| LFS | 4 |
| LFS | 4 |
| LFS | 3 |

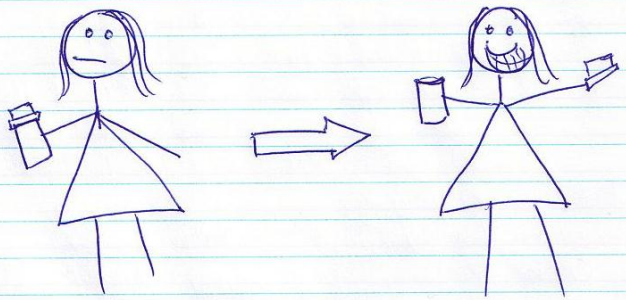
**Appendix VI**

Our group designed the following signs to address specific contamination issues, for display in washroom stalls to draw awareness. We were unable to locate an artist, so have included the rough preliminary sign prototypes.



# Before you compost your paper cup... take off the plastic lid!



UBC's in-vessel composter can compost many things that you cannot compost at home, but plastic and styrofoam items do not break down... they belong in the garbage. Reduce contamination to help the in-vessel make rich, nutritious compost for UBC plants!

✓

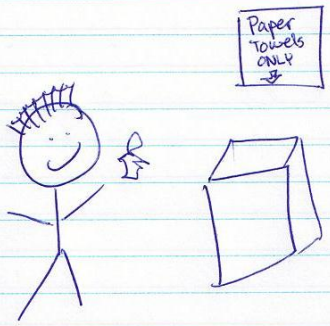
- used paper plates, cups, napkins
- leftover pizza, burgers, fries, etc.
- apple cores and banana peels

✗

- plastic drink lids
- chopsticks
- plastic or styrofoam cups or containers
- milk cartons or juice boxes

Milroy

# Before you leave the washroom, Compost your paper towel!




UBC's in-vessel composter can compost many things that you might not be able to compost at home, including paper towel. Paper towel is very high in carbon, and can help balance the chemistry of the composting process. Help divert waste from the landfill and into the in-vessel to make rich, nutritious compost for UBC plants!

✓

- used paper plates, cups, napkins
- leftover pizza, burgers, fries, etc.
- apple cores and banana peels

✗

- plastic drink lids
- chopsticks
- plastic or styrofoam cups or containers
- milk cartons or juice boxes

Milroy