Reusable to-go Containers at UMass Amherst

Reusable to-go Containers at UMass Amherst

This research paper addresses the implementation of a reusable to-go container pilot program at Berkshire Dining Commons using an internal management system with 1,000 reusable to-go containers. This is a system where participating students receive a credit on their UCard which they can exchange on entrance to the dining hall to get a clean container. Then they can use the container as they please and return it to the dish return for their UCard credit back. Dining services will clean the used containers and return them into circulation. The purpose of our project is to eliminate single use containers. UMass Amherst spends $278,378 (6) over a five year period on these single use containers at Berkshire dining commons and transporting them to landfills alone (3). We would spend about $8,200 (10) for one time implementation costs along with about $420 on water usage (8), and an estimated $4,095 on broken containers, which will give us a net savings of $265,563 over five years, accounting for all costs and savings. This will also reduce trash by about 20 metric tons (3) by eliminating single use containers. Not to mention the 100 metric tons (3 and 9) of carbon emissions we will avoid over a five year period from reduced transportation of trash and the manufacturing of the single use containers. This proposal will have the most significant and positive impacts on campus sustainability in the next five years.

Each year, in the United States alone we produce about 230 million tons of waste (5). This contributes significantly to global climate change through harmful greenhouse gas emissions such as methane. UMass Amherst is part of this problem, contributing about 3,000 tons of waste each year which gets sent to landfills (3). This waste often has compostable to-go containers mixed into it and eliminating these containers from the waste stream is part of the solution to this problem. The amount of money saved and waste reduced from implementing a reusable to-go container program at UMass would have a substantial impact on the University's spending and waste reduction even in just one year of use. At the current moment, UMass Amherst is spending about $55,510 (6, 7, 8) a year on Berkshire Grab n' Go for these single use containers, and producing around 9,200 pounds of waste by disposing of them. This in turn emits about 20 metric tons of carbon into the atmosphere from producing and transporting these single use containers (3 and 9). These statistics show that there is a large area of improvement to reduce these values. Implementation of a pilot program at Berkshire Grab n' Go would not only save the University money, but it would also help reduce waste and carbon emissions soon after implementation. From these factors, it is clear that our proposal would have the most significant and positive impacts on campus sustainability in the next five years.

GET Eco-Takeout Container Jade Plastic 9"L x 9"W x 3 1/2"H from Hubert: Proposed reusable to-go container for purchase.

The first step in implementing the use of reusable to-go containers on campus is to acquire the necessary amount of reusable to-go containers which are made of recyclable material. You may choose to charge an initial fee to the consumer when they first get food in a reusable to-go container or simply provide the first credit and require payment for replacement. The student uses their credit upon entering the dining hall to receive a clean reusable to-go container. Then the student can use the container and bring it back to the dish return area to receive their credit back. Several other colleges across the United States have implemented reusable takeout container programs. For example, UC Irvine has a program in which a $6 container and $4 cup can be purchased and filled with any menu item. The cups and containers can then be returned for clean ones and to be used again or they can be kept by the customers (1). Another example would be the Harvard Business School, which has implemented such a program, where the to-go containers have expected lifetimes of over 1,000 uses and the new containers are said to pay for themselves several times over during their lifetime (2).

Another big step in ensuring such a program would function properly at UMass is guaranteeing proper student engagement and buy in. What good would such a program be if students did not care to participate properly? To ensure this factor, we administered a student perception survey at Berkshire Grab n' Go to gather data on the initial ideas of this project with the student body. Results from this survey showed us that roughly 50% of 2,219 students who responded found themselves throwing their compostable container in the trash at a frequency of "most of the time" or "all the time" showing the need for a change in the system. When asked how willing students would be to participate in a reusable container program at Berkshire Dining Commons, nearly 72% of 2,221 students responded that they would be "likely" or "very likely" to participate, showing that student participation for such a program would be very high.

Additionally, when students were asked how much they personally cared about sustainability and preserving the environment, the average response was an 83/100, on a scale of 1-100 (1 being the lowest margin of care for the environment, 100 being the highest). Through this data collected through our survey to over 2,200 students on the UMass campus, it is clear that student buy in and participation is and would be high for such a project, ensuring the success of implementing such a program at Berkshire Dining Commons.

It will take time to create a program that fits UMass as well as getting students to participate. Initial costs will be around 8,200 dollars as enough containers have to be bought along with some extras as to accommodate for lost or damaged ones (10). In the long run, using reusable containers will be a more cost-effective and more sustainable solution for UMass.

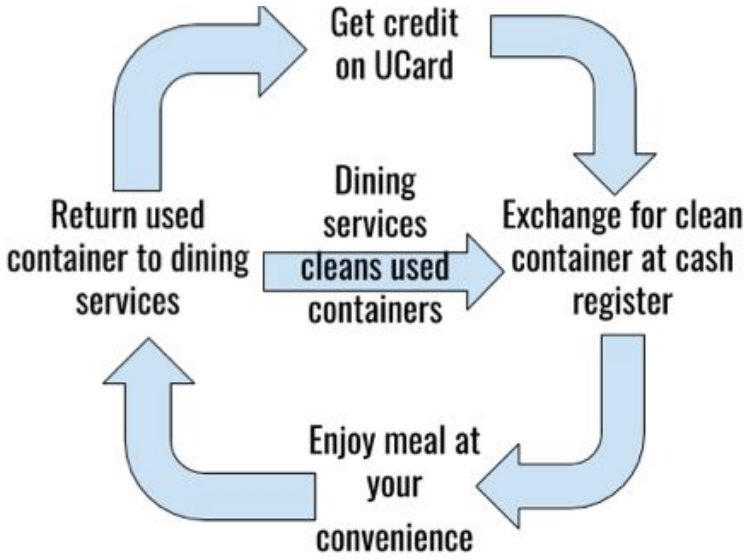

Diagram of how a reusable to-go container program would work on a college campus

Implementing a pilot program of reusable to-go containers to replace single-use compostable containers has many potential benefits for UMass Amherst Dining. The amount of trash and material needing transportation would be reduced which would cut carbon emissions. In addition, UMass Amherst would save money by purchasing reusable containers rather than single-use compostable containers. However, there are also a few drawbacks of implementing such a program. First, the increase in water usage and integrating the reusable to-go containers into the dishroom process may be an obstacle. Second, organizing a program where students must return their container before receiving a new clean one. Finally estimating an exact number of containers to initially purchase for use in the pilot program at Berkshire Dining Commons.

The three major pros of implementing a reusable to-go container system at UMass are money savings, reduction in waste, and environmental impact. If our university made this switch,

we would save around $53,113 yearly (3,6,7,8,10). In the Fiscal Year 2016, UMass Amherst purchased roughly 91,000 units of single use biodegradable three compartment containers for Berkshire Grab n' Go (6 and 8). Each container costs $0.61 per unit (7), which comes to about $305 per day. The second impact is the reduction in waste that would come from this switch which is also very substantial. Since there are not many compost bins throughout campus, most of the single use biodegradable containers end up in the garbage which gets sent straight to landfills. If these 91,000 containers were taken out of the system and not used every year, the University would reduce waste and compost output by around 9,210 pounds just from Berkshire Grab n' Go (3). Lastly, If UMass were able to reduce their waste production by implementing a reusable to-go container program, it would improve sustainability on campus. This would be good for the environment and the green image UMass Amherst strives to achieve.

If we were to engage in a one year pilot program at Berkshire dining commons, we would need about 1,000 reusable to-go containers, which will come out to an initial cost of $8,190 for the containers (10). In addition, the increase in the number of gallons of water used on campus will be a large factor in determining the impact of implementing a reusable to-go container program at UMass Amherst. On average, at the Berkshire Dining Commons, the dishwasher uses about 270 gallons per day and usually handles about 125 loads (8), which comes to about 46 cents per day or $84 a year (8). If the reusable to-go containers were to be incorporated, more stress would be placed upon the dishroom with more loads per day. We estimate though after consulting dishroom managers and personnel that this would still be comfortably managed day to day and would not create any real issues other than small infrastructure changes to accommodate these containers being cleaned.

This is a very beneficial technology and program for UMass Amherst to implement based on the data that has already been collected on money spent on containers, waste, the longevity of these containers, and the money that could be saved. Implementing reusable to-go containers would push UMass in an important direction for green initiatives while also saving money in the long run.

A plan to implement a reusable to-go containers pilot program at UMass Amherst has to include the logistics of a collection system. This involves how the plan will address the factor of getting students to return the reusable to-go containers. One option for an organization system would be to use a token system where students pay an initial $4 to participate in the reusable to-go container program and be issued a token that can be used at the cash register to receive a container. Once they are finished using the container they can bring it to the dishroom and receive a token upon return (2). Ideally it will be worked out that students can simply have a credit on their UCard and scan their cards to and from Grab n' Go for convenience. The AGREENOZZI system is a promising future technology for a reusable to-go container program that utilizes this token system.

OZZI reusable to-go container return system by AGREENOZZI

The OZZI machine system is an automated return system that specifically O2GO containers that are compatible with the return machine. This system is being utilized at McGill University, Virginia Tech, Southern Indiana University, Pepperdine, Tulane, Rochester Institute for Technology, and many more. OZZI machines are used to replace disposable single use containers such as the current compostable to-go containers being used at UMass Amherst. They utilize remote online monitoring to constantly assess the functionality of the unit. In other words, the OZZI machine monitors itself and displays an alert when it needs to be emptied. It keeps track of a list of self maintenance protocols and sends any error reports to a remote control center where the OZZI tech team can assess and work out the problem. This allows for quick solutions to any problems with the functionality of each machine (4).

Students will receive / purchase tokens at the beginning of the year and be able to put them into an OZZI machine and get a clean reusable to-go container. Then when they are done using the container, they will place it into the machine and receive a token. This eliminates the problem of students taking too many containers and not returning them into circulation. Each OZZI machine has a capacity of 125 dirty reusable to-go containers (4) , so in order for a pilot program at Berkshire dining common to be feasible, we would require at least 2 OZZI units. The pricing of an OZZI machine is also very affordable for the University and would pay for itself in only a short amount of time. One OZZI unit costs $11,999 so two units would be just less than $24,000 dollars. Once the containers, tokens, and installation are all accounted for it would likely cost the University just under $30,000 for total installation of these OZZI units (4). The OZZI

machine would reduce waste / compost waste by 23 kilograms per day by reducing the compostable container usage (3 and 8).

The OZZI system is the first big step in updating UMass's green technologies and pushing us in a direction of economic, social, and environmental improvement on campus.

There are several benefits to using this machine system as well as some disadvantages. OZZI machines with their O2GO containers are used to replace disposable single use containers, such as the current compostable to-go containers being used at UMass Amherst. They self-monitor and display an alert when it needs to be emptied. They also keep track of a list of self-maintenance protocols and send any error reports to a remote control center where the OZZI tech team can assess and work out the problem. This allows for quick solutions to any problems with the functionality of each machine(4). Students will receive/ purchase tokens and be able to exchange them at the cash register for a clean container.Then when they are done using the container, they will place it into the machine and receive a token. This eliminates the problem of students taking too many containers and not returning them into circulation. Currently, Grab n' Go at Berkshire dining commons uses around 500 to-go containers per day (8), which translates to $305 worth of containers each day (7). This cost can be completely eliminated by the use of a reusable to-go container program. Also, the OZZI machine would reduce waste / compost waste by 23 kilograms per day by reducing the compostable container usage (3) which will save the additional cost of waste transportation. This means that the OZZI system could be a great long term investment for the University.

If UMass Amherst implemented the OZZI system, there would be cons along with the many benefits. For example, implementation of the OZZI machine system is initially expensive. Research suggests that for Berkshire Grab n' Go, two OZZI machines would be necessary to hold the needed amount of reusable to-go containers and would cost a minimum of $30,000 to implement (4). Additionally, the necessary cleaning of to-go containers would also increase water consumption in the dining hall by 90 gallons per day (8). Another down side of implementing the OZZI system would be issues with the token system and lost tokens. Until a system could be implemented using UCards, students would need to pay the $4 charge and get a token which would then be used for the machine. Issues with lost tokens would present a problem but this could be easily fixed in the future with the use of an electronic card system. Lastly, this technology has been piloted on campus before. The cost was too much for the worth of use at the time. This cost could be mitigated with proper program implementation such as the student charge for to-go containers.

The need for new, affordable, and efficient technology on college campuses to make a greener campus for all is an incredibly important benchmark to achieve. Environmental, societal,

and economic factors are essential when considering adopting a new technology. The OZZI system has a few manageable downsides, however, we believe this is the technology initiative needed for a campus like UMass Amherst. The money saved and waste reduced in the long term speaks for itself in how efficient a technology this could be for a university with such a large student body. Making a switch to this new system, and dumping our old outdated system would send UMass in a greener, cleaner direction. The OZZI system is the first big step in updating UMass Amherst's green technologies and pushing us in a direction of economic, social, and environmental improvement on campus.

In conclusion, reducing the amount of waste produced at UMass Amherst will be significantly beneficial to the University in monetary savings as well as reduced carbon emissions. The $55,510 yearly savings (3,6,7,8,10) would be reduced from spending on compostable containers is a very substantial amount and could be used for other sustainability initiatives around campus. Based on the success that other universities in the United States have experienced, implementing reusable to-go containers is a realistic solution for the UMass Amherst campus, especially with the number of dining facilities across campus that currently use compostable containers as well as the large student body. Switching to this reusable to-go container program and eliminating single-use containers will be a financially and environmentally positive decision. Our proposal would have the most significant and positive impacts on campus sustainability in the next five years.

Research Strategies Essay:

With over 30,000 undergrad and graduate students, the University of Massachusetts Amherst has one of the largest university dining programs in the country. At one of the university's four main residential dining locations, Berkshire Dining Commons, the university spends upward of $55,000 per year on compostable to-go containers for its Grab n' Go outlet. Only ~10% of these renewable plant-fiber-based containers, however, actually end up being composted. In this study, we examine the environmental impacts and cost-savings opportunities from implementing reusable and washable to-go containers instead, and design a pilot program to test its feasibility. The factors examined to determine whether this program would be appropriate for the University as a whole were economic feasibility, environmental impacts, student convenience and engagement, as well as possible infrastructure changes needed. We collected data for the study through a 2,000-person survey administered at Berkshire Dining Commons, as well during two pilot project phases with test groups of 30 students each. The pre-pilot survey suggested that student engagement in the system would likely be successful at a larger scale, and based on this data, we conducted a feasibility analysis to explore the economic and environmentally trade-offs involved in expanding the University's commitment to this new system. Our poster discusses potential areas of survey bias in student engagement and perception, and presents some preliminary results from the first phase pilot study.

The research process for this project and research paper was very thorough and extensive through the media outlets we had access to to gather our data. This project began from an assignment to write a proposal for a sustainable solution that could be implemented on campus. After viewing a video online highlighting reusable to-go containers on other campuses, research began to investigate if reusable to-go containers could be used on the campus of UMass Amherst. Since this is a project that is very new to universities and society because of the recent developments of compostable containers and reusable containers, there exists a very finite and specific amount of data on this topic. The research compiled about reusable to-go containers and their subsequent programs was taken from other university websites and other published articles, our university website sources of waste management, auxiliary service purchase reports, and surveys and interviews we conducted with University officials. University archives and technical reports were the main source of data that was compiled for our research.

As specified in paragraph 4 in the research paper, we administered a survey to students to collect data on student perception of the project. Additionally, we also interviewed Grab n’ Go workers and managers to collect data on the number of students and containers used on a daily basis at Grab n’ Go as well as the amount of disposable containers purchased for Berkshire Dining Commons. This data was utilized to calculate money spent and potential savings for the university if a reusable to-go container program is implemented at Berkshire Grab n’ Go. Faculty

involved in sustainability on-campus, such as Ezra Small and Laurie Simmons, were also interviewed to get more information about the compostable containers and waste management on campus.

Bibliography

1. "What We're Doing on Campus." *Environmental Sustainability - UCIrvine*, UCIrvine Dining.
2. Durst, Matt. "Reusable to-Go Ware Options for HBS." *Sustainability at Harvard*, Harvard University. 1 July 2016.
3. "Materials Destinations and Vendors." *Office of Waste Management*, UMass Amherst.
4. Ehrenberg, James. "Changing the World from Disposable to Reusable, One Meal at a Time." *OZZI*, OZZI Industries.
5. Fischer, Amory. "Sustainability Initiatives by Student Organizations Funding Proposal." *Sustainable at VT*, Virginia Tech. 24 Oct. 2014.
6. Pepi, J. (2018, March 29). Email.
7. Young, C. (2018, April 3). Email.
8. Pipczynski, R. (2018, April 6). Personal Interview.
9. Harnoto, M. F. "LCA Compostable and Reusable Clamshells" *A Comparative Life Cycle Assessment of Compostable and Reusable Takeout Clamshells at the University of California, Berkeley.* (2013).
10. "G.E.T. 3 Compartment Jade Polypropylene Eco-Takeout Container - 9'L x 9'W x 3 1/2'H." *Hubert Custom Displays*, Hubert Company.