

**An Investigation into the Bring Your Own Container Project Implementation**

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**University of British Columbia**

**APSC 261**

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APSC 261 – Sustainability Project Report

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## ABSTRACT

This report is written as a response to UBC's demand of a new food waste management system to be implemented on the new Student Union Building (SUB). In this report we are proposing a new system which will be referred to as Bring Your Own Container (BYOC) project. This system is designed to decrease waste generated by the new SUB. Detailed descriptions and implementations of the system is included in this report. Furthermore, this report also includes our conclusion and recommendation on how to successfully implemented BYOC system.

As a food management system BYOC is inspired by previous systems and sustainability initiatives taken by UBC Food Services. In fact, we can view BYOC as a further development of the current UBC Food Service initiatives Eco-to-go. By combining the efforts of students bringing their own containers or joining the Eco-To Go program, and the food services encouraging students to participate, the new SUB can becoming a hub where a sustainable eating society can grow.

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## LIST OF ABBREVIATIONS

BYOC	Bring Your Own Container
UBC	University of British Columbia
SEEDS	Social Ecological Economic Development Studies
SUB	Student Union Building

# 1 Introduction

As an institution, the University of British Columbia (UBC) is one of the leading universities in working toward sustainable environment. Indeed, UBC's commitment toward sustainability is reflected throughout its various departments and subdivisions. In this report, we will pay particular attention toward UBC Food Services, especially UBC Food Services that operates in the Student Union Building (SUB).

UBC Food Services has been serving the campus and the surrounding communities for more than 80 years. Adapting sustainability as its view, UBC Food Services has set its goal toward encouraging waste reduction and focusing on the usage of biodegradable products. Moreover, UBC Food Services also involves in various sustainability initiatives to better promote sustainability around the campus (UBC Food Services Website).

## 1.1 Pre and Post-Consumer Organic Waste Program

Further encouraging the usage of biodegradable products, UBC Food Services is working with UBC Waste Management to better process pre and post-consumer organic waste generated by the SUB. Pre and post-consumer organic waste is composted in the on-campus composting facility and then further used as fertilizer for UBC grounds. By doing this UBC Food Services successfully reduces the amount of organic waste going into the waste stream by 125 tons.

## 1.2 Waste Reduction and Customer Incentives

Supplemental to the pre and post-consumer organic waste program, UBC Food Services also initiated other opportunities to further reduce waste and to increase awareness toward biodegradable materials. In fact, UBC Food Services enforces all its outlets to use biodegradable materials for all single-used items such as, napkins, paper plates, and cutlery. Furthermore,

discounts are given to students who are using their own reusable food and beverage containers. Thus, this initiative benefits both the students and UBC. Indeed, at the start of this initiative, UBC Food Services achieved 20% reduction on the usage of paper cups.

### **1.3 Cardboard, Metal, Glass, Paper, and Plastic Recycling**

As its attempt to encourage non-degradable materials recycling, UBC Food Services has increased the number of recycling bins, which located in various areas of the SUB. However, based on the student survey (see Appendix A.) our team conducted, only 50% of the students indicated that they recycle their paper, plastic, compost, and drink containers. On the other hand, another half of the students indicated that they recycle only when they see recycling bin around. Lastly, a small percentage of the students indicated that they are confused about which waste/materials can/cannot be recycled. Indeed, there is a need for UBC Food Services to strategically place the recycling bins, as well as to provide better explanation on materials which can/cannot be put inside the bins.

### **1.4 Waste Processing**

With all the sustainability initiatives UBC Food Services have taken, our next step is to determine how much progress UBC Food Services has made toward its vision of sustainable environment. Fortunately, we can evidently determine the progress UBC Food Services has made by observing the amount of waste it generates. However, first, we need to observe how UBC Food Services manages the waste it generates.

As mentioned in the previous sections, UBC Food Services is working together with UBC Waste Management to process its waste. UBC Food Services gathers its organic waste in green bins, which are collected biweekly by the UBC Waste Management. The organic waste then transferred to the on-campus composting facility located on the south campus. In the facility the



waste is composted inside an enclosed vessel, which has the capacity to handle up to 5000kg of waste per day. The table below estimated the amount of compostable waste generated by UBC SUB yearly.

Table 1. Summary of Compostable Waste Generated by UBC SUB

	<b>Annual Mass (kg)</b>	<b>Density (kg/m<sup>3</sup>)</b>	<b>Annual Volume (m<sup>3</sup>)</b>
<b>Food waste</b>	18232	1029	17
<b>Other paper</b>	16703	228	73
<b>Compostable dishes</b>	6515	228	29
<b>Cardboard</b>	407	260	2
<b>total</b>	41857		121

Indeed, from the point of view of compostable waste, as long as the amount of waste generated does not exceed the capacity of the composting vessel, we can see that UBC Food Services sustainability initiatives are a success. However, we also need to take into consideration the amount of non-degradable/non-compostable waste generated by the SUB to alter our system toward sustainable environment.

Based on the data retrieved from the UBC SUB Waste Audit (Felder, 2001), we can observe that UBC Food Services generates up to 28.4 tonnes of non-degradable material annually (see Table 2. on next page). Furthermore, the audit also shows that UBC Food Services generates up to 14 tonnes of recyclable materials annually (see Table 3. On next page).

Table 2. Residual Materials Generated in Different Areas

Activity area	Residual plastic ± C.I.	Miscellaneous ± C.I.	Metals ± C.I.	Total residual material ± C.I.
Animal care				
Bookstore	1.2 ± 1.4	0.19 ± 0.50	0.08 ± 0.18	1.5 ± 1.6
Classrooms	7.7 ± 1.6		0.85 ± 0.37	8.6 ± 1.9
Common use	32.1 ± 7.6		6.2 ± 7.5	38 ± 15
Food service-				
Coffee	11.4 ± 2.5	0.7 ± 1.8	0.72 ± 0.59	12.8 ± 3.1
Meal plan	8.2 ± 1.8	0.5 ± 1.3	0.52 ± 0.43	9.2 ± 2.3
Restaurant	5.6 ± 6.8		0.82 ± 0.70	6.4 ± 6.1
Greenhouse	1.98 ± 0.25	0.18 ± 0.28		2.16 ± 0.29
Laboratories				
Library	5.3 ± 5.3	0.07 ± 0.29	0.36 ± 0.17	5.7 ± 5.2
Offices	96 ± 48		6.6 ± 7.3	103 ± 51
Residence-				
1 <sup>st</sup> year	22.8 ± 8.0		8.2 ± 3.2	30.9 ± 8.9
2 <sup>nd</sup> /3 <sup>rd</sup> year	18.7 ± 6.6		6.7 ± 2.6	25.3 ± 7.3
4 <sup>th</sup> year	20.7 ± 7.3		7.4 ± 2.9	28.1 ± 8.1
Family	32.5 ± 11.5		11.6 ± 4.5	44 ± 13
Other space-				
Bathrooms				
Other space-				
Outdoor bins	6.5 ± 4.8	0.01 ± 0.03	0.85 ± 0.65	7.3 ± 5.0
Total: (± 3 s.d.)	271 ± 74	1.7 ± 3.0	51 ± 16	323 ± 80.

Table 3. Recyclable Materials Generated in Different Areas

Activity area	Office fine paper	Newspaper	Old corrugated cardboard	Recyclable glass	Recyclable plastic	Metal	Total material
Animal care							
Bookstore	0.64 ± 0.26	0.04 ± 0.14	0.16 ± 0.20	0.15 ± 0.07	0.04 ± 0.12	0.01 ± 0.04	1.04 ± 0.22
Classrooms	3.69 ± 0.99	6.9 ± 2.2		12.16 ± 0.74		1.05 ± 0.62	23.9 ± 4.6
Common use	3.2 ± 6.0	11 ± 15	1.5 ± 4.7	15.3 ± 4.8	1.9 ± 2.6	1.8 ± 2.1	34 ± 31
Food service-							
Coffee shop	0.11 ± 0.16	0.65 ± 0.95	0.74 ± 0.74	3.6 ± 5.8	1.2 ± 1.1	0.11 ± 0.18	6.4 ± 6.1
Meal plan	0.08 ± 0.12	0.47 ± 0.69	0.53 ± 0.53	2.6 ± 4.2	0.87 ± 0.80	0.08 ± 0.13	4.6 ± 4.4
Restaurant	0.06 ± 0.75	1.2 ± 3.5	0.7 ± 8.8	1.1 ± 4.1	0.2 ± 2.1	0.22 ± 0.03	3 ± 13
Greenhouse		0.01 ± 0.01		0.07 ± 0.09	0.01 ± 0.01		0.11 ± 0.21
Laboratories							
Libraries	14 ± 17	1.1 ± 3.5		5.1 ± 9.2	1.09 ± 0.98	0.87 ± 0.64	22 ± 14
Offices	35 ± 34					5 ± 11	42 ± 41
Residence-							
1 <sup>st</sup> year	15.3 ± 7.2	8.8 ± 4.3	1.8 ± 1.8	14.4 ± 5.1	1.9 ± 1.6	0.45 ± 0.25	43 ± 13
2/3rd year	12.6 ± 5.9	7.2 ± 3.5	1.5 ± 1.5	11.8 ± 4.2	1.6 ± 1.3	0.37 ± 0.20	34 ± 10
4 <sup>th</sup> year	13.9 ± 6.5	7.9 ± 3.9	1.6 ± 1.6	13.0 ± 4.7	1.8 ± 1.5	0.41 ± 0.23	39 ± 12
Family	22 ± 10.	12.6 ± 6.2	2.5 ± 2.5	20.4 ± 7.3	2.8 ± 2.3	0.65 ± 0.36	61 ± 18
Other space-							
Bathrooms							
Other space-							
Outdoor bins	0.79 ± 0.56	1.9 ± 1.8		1.8 ± 1.6	0.27 ± 0.18	0.10 ± 0.14	4.8 ± 2.4
Total: (± 3 s.d.)	121 ± 51	60 ± 27	11.0 ± 8.2	102 ± 25	13.6 ± 6.1	11 ± 14	320 ± 77

Although the data retrieved seems to be outdated, our assumption is the data still valid due to the fact that there is no major alteration to the system made ever since. Indeed, we can see

there are rooms for improvement to further reduce the amount of non-degradable/non-compostable materials generated by UBC Food Services. Similarly, there is a need to increase the awareness of recycling and reusing.

## 2 Discussion

### 2.1 New System Design – Bring Your Own Container

One of the main barriers faced by any new project or idea is its cost. In order for the BYOC project to be a success it has to be financially viable for both the consumer, who in this case are the students, and the vendors. Without cooperation and enthusiasm from both parties, the project is futile. We need everyone to contribute in order to have a substantial impact and to create a more sustainable student union building. There is no greater motivation for a student who is on a fixed income to take part in program or initiative than saving money.

Our project takes advantage of the current Eco-To Go program by analyzing what worked and what didn't work and then builds upon it by addressing its two major flaws. The Eco-To Go program is an excellent concept but fails to address the issue of a sustainable, reusable drink container and is massively let down by a complete lack of awareness throughout the student body. According to our survey, over 75 % of students are unaware of the program. Our program carries over all the current benefits of the Eco-To Go program, our program continues to offer a onetime membership fee and a reusable container that can be picked up at any participating UBC food outlet. As well, a further discount is offered through the use of a reusable washable drink container. The Eco-To Go program is plagued by the scarcity of washing stations around campus and because sizable infrastructure is needed to wash all these additional place settings from a large portion of the student body the new Sub is the ideal place to incorporate a large scale washing station designed to handle the required volume. Most importantly, our program emphasizes the need for effective, highly visible advertising in order to increase significantly public awareness and participation.

University students are considered to be quite lazy and uncleanly. Their residence rooms are often considered to resemble pig sties. While this may not be true of all university students, it is true for a significant portion. In order for a BYOC program to appeal to the masses, students must be offered a quick and easy way to wash the disposable containers rather than be expected to carry the dirty containers around all day and wash it themselves. The New Sub is still a long way from being completed which provides an opportunity to incorporate a washing station designed to handle the required volume into the infrastructure. With a washing station designed and built for this explicit purpose, it would require no more effort for students using a reusable container than disposing of paper plates and drinks, while placing only a small additional load on UBC food services.

### **2.1.1 Triple Bottom Line Assessment**

### **2.1.2 Economical**

UBC has a waste reduction program that includes providing a reusable food container for people who signed up for the program. The Eco-To Go program implements the idea to use reusable container rather than single use take-out container. The membership fee for this program is \$5 and it has no expiry date. The idea of this program is to exchange the membership card for a clean container, and return the used container to be washed. However, according to our survey, 75% of the students do not have any knowledge about Eco-To Go program.

Currently, UBC food services give customers a 15 cents discount for people who bring their own container. An additional 35 cents is also reduced from the total price since the costumers do not buy the disposable container from the outlet. In total, costumers of UBC food

services can save 50 cents by bringing their own food container. Assuming that UBC buys the disposable food container for 35 cents and sells at least 1000 containers per day, UBC can save more than \$350 per day on food containers. With the new upcoming BYOC program at the new SUB, students should expect compensation to the impracticality of this program. According to our survey, most of the costumers expect more or equal than 10% discount for their purchase.

In order for this project to succeed it needs to be enticing for both venders and customers. Through the use of reusable drink containers, plates and cutlery, venders save on wasteful paper cups, plates and plastic utensils and are then able to pass those savings on to customers. The average cost to a vender for a standard soft drink without the disposable cup, plastic lid and straw is between ten and 20 cents. The costs saving implications are obvious. They benefit the bottom line of a vender and likely increase their business. There is the added bonus of keeping thousands of plastic drink lids and straws that are not biodegradable and out of landfills. Replacing plastic cutlery with washable, stainless steel cutlery has a larger capital cost of approximately 50 cents per piece for medium quality steel cutlery compared to an average cost of 1.5 cents for each plastic utensil of average quality. After just 33 uses, the capital cost of the steel utensils has been paid off allowing the venders to then make an additional profit on each future sale. There is the added bonus of keeping supposedly biodegradable plastic utensils out of landfills which can take over one hundred years to decompose unless under optimal conditions which are rarely present. Steel utensils are far more user friendly than flimsy, plastic cutlery resulting in a happier customer. This benefits all parties, and once the steel utensils have had their full use, they can be recycled.

### 2.1.3 Environmental

UBC's goal to achieve a sustainable food system across the campus is a long-term goal that can only be achieved when UBC commit and implement SEEDS projects on their campus. According to UBC website, there are more than 50,000 students across the campus. The amount of students that buy their lunch/dinner on campus is tremendous in amount. With more than 20 food outlets across the campus, UBC effort to create a waste free environment is currently achieved by serving the food using a biodegradable food/beverage container. Although the usage of biodegradable food/beverage container is good for our environment, the option of buying a single use container still resulting in waste to our environment.

Looking at the environmental aspect of the BYOC program, this program creates a waste free environment in terms of food packaging. The current biodegradable food/beverage container still creates a waste to the environment. By using our own reusable container, student on campus could reduce the waste of the container and the food waste. Unfinished food could be saved on their own container because the reusable container has better seal than the one that is served on UBC.

Our assumption in this assessment is based on the previous study on reusable food container. According to the triple bottom line assessment on reusable food container that is performed by previous APSC 261 students, Ziploc is the most popular reusable food container because of their cheap price compared to other brand. Ziploc reusable plastic container is made from polypropylene and can be recycled after its lifetime. The lifetime of Ziploc reusable plastic

container varies on the usage of the container itself. When the lid is no longer seal properly, it is time to recycle the container.

Polypropylene has been identified as one of the plastic that has a greater potential in term of recycling. Majority of polypropylene comes from a reusable food container. Although the food container might have some food residue, it could be cleaned with relative ease. By using a steam or detergent, the food container is cleaned before it goes to the recycling factory. According to the research that is done by Recoup, the product of recycled polypropylene has an acceptable property compared to the pure polypropylene. In term of their impact performance test, the container that is made from recycled polypropylene passed within 5% of the height achieved by a virgin polypropylene. However, the recycled polypropylene has a darker color compared to the virgin polypropylene. The comparison of the color can be seen on the following figure.



Figure 1 – Color comparison of recycled polypropylene and virgin polypropylene

<Source: [http://www.recoup.org/shop/product\\_documents/147.pdf](http://www.recoup.org/shop/product_documents/147.pdf)>



With the BYOC program, UBC can become one step closer in creating a sustainable food system. Using a reusable container, students effectively reduce container waste and food waste. In addition, once the reusable container exceeds its lifetime, it is possible to recycle the container.

#### **2.1.4 Social**

Every program that promotes the idea of sustainability has social aspects that need to be considered. Looking into UBC point of view on this program, BYOC program has very little effect on UBC food services' staffs. However, BYOC program will create impracticality for people who don't bring a container for their food. In customer point of view, there will be an extra effort to bring a container in order to get the food. In addition, customers have to deal with their food waste and cleaning their own container.

This program will also have an impact on how the UBC food services' staffs portion the food. As people will bring different sizes of food container, UBC need to have some sort of standard on portion of the food. In order to do that, the UBC food services' staffs might have to attend a one-time training on how to serve a consistent portion of the food.

When BYOC program is implemented on the new SUB, the first couple of weeks will be the most challenging phase of the program. The program advertising is important for customer. According to research done by LFS 252 student on quantitative analysis of Eco-To Go program, the lack of advertisement is the main reason why the program is not widely used on the campus. Moreover, options must be made for 'visitors' that are not familiar with BYOC program.

Technically speaking, the Eco-To Go program is excellent but the designers failed to take into account the human element. We are proposing some improvements to the current program. To create greater awareness, it is crucial that several advertisements be placed in high visibility areas, preferably in the new sub cafeteria. Currently there are small signs placed sporadically around campus that advertise a mysterious “Eco-To Go Program” but they contain few other details and leave potential customers curious with no other obvious source of information. All it will take is a few central advertisements to bring attention to the program and highlight all the benefits that accompany the program. If UBC food staff is willing to play ball with our design for the first two weeks of each new semester, vendors will pre-emptively ask customers if they would like to participate in the new BYOC program. Ideally by raising awareness, students will become the most effective source of advertisement by telling their friends about the program and how they save money and help the environment through sustainable living practices.

### 3 Related Projects and Programs

There are many programs out there that BYOC can learn and build from. This section will briefly describe a few of the programs currently running at UBC and in other institutions all over North America.

#### 3.1 At UBC

As mentioned earlier in the report, UBC has recently introduced a program called Eco-to-Go for the on campus dining areas and participating food outlets. The Eco-To Go container provides a secure and sustainable method of carrying food from the dining area rather than using the typical disposable takeout containers. This lessens the amount of waste that would be added to landfills, where the disposable containers end up in. When the student is done with the container, they can return the dirty container at any time to specific stations, typically located in the Vanier or Totem dining areas. In return, they receive an Eco-To Go card they can use later. Students benefit from this program through the discounted price, but most importantly by becoming more aware sustainably.



Figure 2: An Eco-To Go Container

<Source: <http://www.flickr.com/photos/theflirtyguide/5455149356/>>

In addition to Eco-To Go, there is also a food outlet on campus that provides and promotes sustainable eating called Sprouts. Sprouts is UBC's own non-profit student organization that encourages the use of healthy, sustainable food and reusable containers. They enforce this with a policy to only serve food to students who bring their own containers and cutlery and not provide takeout containers. For those who do not have their own containers, they are encouraged to enjoy their food at Sprouts by using the plates and cutlery provided. Through this policy and sustainable food options, Sprout has created a community of sustainable eating that the new SUB should achieve to expand and nurture.

### **3.2 At Other Universities and Institutions**

Through our research, we have come across many other institutions and universities whom have implemented similar reusable containers program. The benefits of the program are similar to the ones mentioned earlier in the report.

One example is the University of Vermont where a program called the Eco-Ware Reusable Takeout Container program (2008). It is very similar to our own Eco-to-Go program. One of the key differences between the two programs is that the University of Vermont has set out a goal to educate all the students on campus through representatives who go around the dorms to spread sustainability. The active promotion has increased the amount of students enrolled in the program to up to 7%.

A closer example is the University of Alberta's Reusable Dish Program. It provides a rental service on reusable dishes for free. It only requires a \$2 deposit and students can rent a dish that can be used at any vendor in the food court in the university Student Union Building. The

vendors also provide an addition 15-25 cent discount on the meal. It is not as convenient and portable as a reusable container, but is a valid alternative.

## 4 Conclusion and Recommendation

Based on the results of our research, the BYOC program should be implemented into the new sub with a few more additions. The program will also positively affect UBC in socially, economically, and environmentally aspects. We also recommend that the Eco-To-Go program, or a similar program, should be expanded to include all the food outlets in the new SUB so students who do not want to carry around or wash their own containers are provided an opportunity to become involved in creating a more sustainable UBC.

If this program were to be implemented, the issue of student of awareness needs to be addressed. Displaying large signs and posters at the various food outlets that support the program will be greatly beneficial towards informing and getting students involved. These signs and posters should clearly state the purpose of the program, with emphasis on the procedure and benefits. We also recommend that in the first week of school the staff should provide a quick explanation of the program to students to further promote the program. Moving forward with this program, the BYOC should be able to be implemented to all UBC food cafeterias across the campus. This program will makes UBC one step closer to UBC's goal, sustainable food system.

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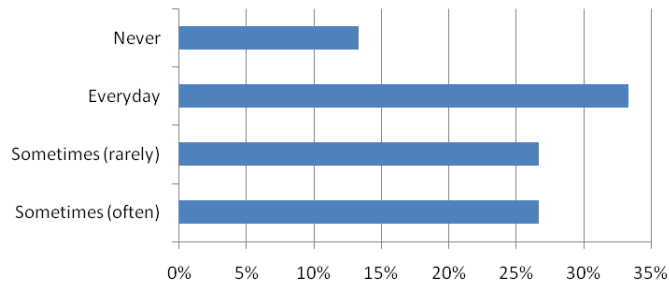
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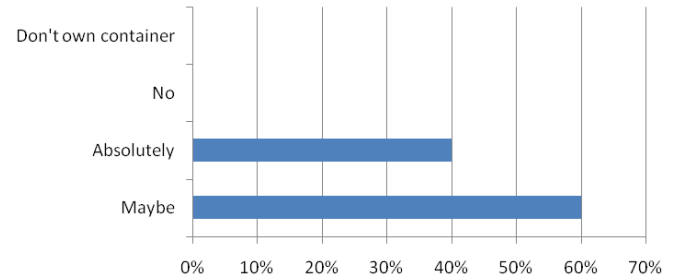


## 6 APPENDIX A. STUDENT SURVEY RESULTS

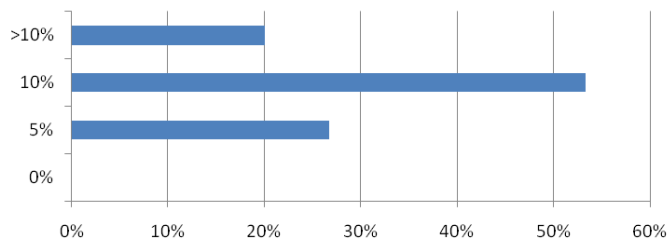
**Question 1. How often do you bring food (with container) to school?**



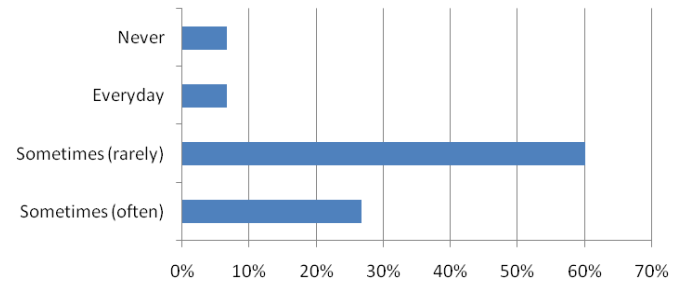
**Question 2. Will you bring container to get a discount?**



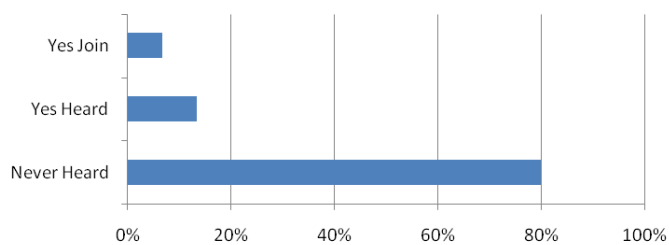
**Question 3. How much should you get a discount if you bring your own container?**



**Question 4. How often do you buy food at school?**



**Question 5. Have you ever heard about To-Go program offered by UBC Food Services?**



**Question 6. How often do you recycle (paper, plastic, compost, drink containers)?**

