Relieving America’s Dependency on Plastic

Rutgers University hopes to target the current dependence on plastic in the United States through reusable containers in their dining hall take-out.

Tag Words: plastic, recycling, source reduction, Rutgers

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Summary

In this day and age, the United States is a global leader when it comes to medical advances, technology…and producing garbage. America is a “throwaway economy” in the sense that consumers heavily rely upon disposable products, typically made from plastic. The dining hall take-out service at Rutgers University epitomizes this current trend by producing a significant amount of plastic waste. Although Rutgers does offer reusable Boomerang Boxes, students typically use disposables instead. We propose that Dining Services should either make the Boomerang Box system mandatory, or they should instate a rewards program encouraging students to use Boomerang Boxes and reusable bags, over disposable containers and plastic bags.
The Issue: Plastic Overuse

Background of Plastic

Plastic is a synthetic material which has become popular in the United States as a result of its low cost and a variety of useful properties, such as: electrical and thermal insulation, color, flexibility, resistance to degradation, strength, and its light weight (ELC 2008). Plastic monomers are created as a byproduct when either oil or natural gas is heated in a process known as “cracking”. These monomers can then be chemically combined to form a variety of polymers known as plastics (ACC 2010, ELC 2008). Although these polymers are primarily composed of hydrogen and carbon, other elements, such as fluorine, nitrogen, and chlorine, are sometimes present (ACC 2010).

Plastics have been around for about 150 years, making them a relatively new material. The first plastic polymer was created in 1862, but plastics did not start becoming prominent until the aftermath of World War I, when petroleum based plastic replaced coal based plastic. Petroleum is easier to mold and work with than coal, which increased plastic’s versatility and decreased the cost of production (ACC 2010). In World War II, plastics were used to create lighter, stronger materials for the troops (ELC 2008). Despite the many benefits of plastic, a downside has been the amplified production of disposable and mainstream products, which has significantly increased the amount of municipal solid waste generated in the United States (ELC 2008).

Disposal of Plastic
Landfills are the number one means of waste disposal (EPA 2009). Although plastic takes up about 25-30% of the space in landfills, it cannot degrade efficiently—taking hundreds to thousands of years to do so (ERF 2008). Aside from being an eyesore, the plastic in landfills makes it much more difficult for organic waste to decompose because it is too compacted (PackagingToday 2010).

The second most common means of disposal is combustion (EPA 2009). Plastic is not a carbon neutral compound. When carbon dioxide is produced from burning organic materials, it is considered “carbon neutral”, meaning it is part of the natural carbon cycle. Because plastics are made from oil, a nonrenewable resource, the burning of these materials adds carbon dioxide which has not been around for millions of years to the atmosphere (Jenner 2008). Carbon dioxide is a potent greenhouse gas, so the burning of plastic contributes to the serious problem of global climate change. In addition, plastics release toxic chemicals as byproducts when they burn, such as sulfur dioxide, particulate matter, and lead (Aslam 2006). Each of these toxins aggravates health conditions ranging from bronchitis to cancer (EIA 2009).
Ocean Impact
Our plastic waste is not restricted to the land. Due to careless littering and the water cycle which feeds our streams and rivers into the ocean, plastic has been accumulating at an alarming rate and volume. As just one example, encompassing some 10 million square miles, the North Pacific Gyre is a location where trade winds and circular currents retain debris without self-propulsion for up to decades at a time (Doucette 2009). Charles Moore, the commander of a 25-ton research vessel called Alguita, was the first to discover this vast mass of plastic waste known as the Great Pacific Garbage Patch. Scientists estimate it is twice the size of Texas and contains some 10 million tons of waste (Doucette 2009). This plastic waste releases harmful toxins and other chemicals into the ocean which upset sensitive ecological functions such as phytoplankton that provide most of the earth’s oxygen. Higher on the trophic level are fisheries and sea turtles which are also negatively affected. Sea turtles mistake buoyant plastic bags for jellyfish, one of their main sources of prey, and choke to death (Doucette 2009).

Plastics Recycling
A better means of disposal than either landfills or combustion is the recycling of plastic. Recycling saves approximately two to five times the energy of combustion because it decreases the demand for completely new materials to be generated (Westlake, 1995). One problem with plastics recycling is that the industry’s demand for recycled plastic is greater than the recycled plastic supplied by consumers, which makes producing goods from recycled materials cost-prohibitive. In addition, the process of sorting types of recycled plastic is labor-intensive, adding to the cost of the industry (PackagingToday 2010). Another issue with recycling is the lack of availability and convenience of recycling programs. Only about 60% of Americans have access to a plastics recycling program, and due to the low profitability of the recycling industry, only 5% of all plastic produced in the United States is recycled (ACC 2010, Packaging Today 2010).

There are seven types of plastic, ranked 1-7. Type 1 plastic is the most easily recycled, which means that less energy is needed to make a new product from this kind of material, whereas the least amount of energy is salvageable from type 7 plastic (ACC 2010). Polyethylene Terephthalate (PET), type 1, and High Density Polyethylene (HDPE), type 2, are the plastics most commonly accepted by recycling programs (EarthTalk 2010). However, even these common plastic types are rarely recycled. For example, bottled water, now a ubiquitous household item in America, is generally made of PET, an easily recycled plastic. Yet, 86% of these water bottles are thrown out instead of recycled each year (Aslam 2006).
Source Reduction of Plastic

Although recycling is a worthwhile means of disposal, source reduction, which means to decrease the amount of waste initially generated, is the most environmentally-friendly option. Source reduction of plastic helps to conserve oil, which is a rapidly disappearing resource, and to alleviate the negative environmental impact that other means of disposal, such as landfills and combustion, have on the environment. Only source reduction offers a 100% return on energy (Bridgwater et al. 1983). On a local level, communities can promote plastic waste reduction through public awareness campaigns and encouraging local businesses to adopt reusable, recyclable, more degradable and less bulky materials for food service, wrapping and packaging (ANJEC, 1998).

The New Jersey Statewide Mandatory Source Separation and Recycling Act of 1987 made New Jersey the first state to institute mandatory recycling as a solid waste management strategy (ANJEC 1998). Following suit, Rutgers University has one of the top recycling programs in the country, for it recycles all types of plastic. In addition, Rutgers recently has made a preliminary effort to decrease the amount of plastic disposable waste generated by dining hall take-out through the Boomerang Box program. The Boomerang Box is a reusable plastic container which students can purchase for $5. Students can bring the box to take-out, instead of using the disposable plastic containers offered there, to transport their food. Each time a student goes to take-out, he/she returns the dirty Boomerang Box, which dining services sterilizes to give to the next student, and receives a clean one. Students only need to make this one-time $5 purchase, which lasts for the remainder of their time at Rutgers.

Dining Services purchased 500 Boomerang Boxes initially and began the pilot program at the Neilson Dining Hall on Cook Campus. Unfortunately, the majority of students still rely on the disposable containers in take-out, instead of purchasing a Boomerang Box. Reasons for its
unpopularity could be that it has not been advertised well and is considered by some as less convenient. The program is available on all campuses but has met a lack of enthusiasm by students.

The Service Project

In summary, our service project was to eventually eliminate plastic containers at take-out in Rutgers dining halls in order to reduce plastic use and expenditures. We initially contacted Kevin Lyons, Executive Director Procurement Services, and Joseph Charette, Associate Director, Cash and Catering Operations to learn more about disposables usage, finances, and the current Boomerang Box program in the dining halls. We then wrote a proposal to Dr. Lyons, Mr. Charette, and Mr. Charles Sams, Executive Director Dining Services, in which we suggested making Boomerang Boxes mandatory by charging an initial fee at the beginning of students’ academic career. An alternative suggestion was to create a rewards system for students who used Boomerang Boxes. We also wanted to make a plastic bag receptacle available at take-out in order to further extend the greening initiative. Refer to Appendix 3 for full proposal.

-Who Did What-

Jenny Lach - researched information; wrote: Summary, Background of Plastic, Disposal of Plastic, Plastics Recycling; contributed to Works Cited; reformatted Classipedia to look like a Wikipedia document; wrote proposal with James; edited the whole document

James Preisendanz - researched information; wrote: Ocean Impact, Source Reduction of Plastic, Community Service Project; contributed to Works Cited; added pictures; wrote proposal with Jenny

References


Editorials

Op/Ed Article- sent to the Star Ledger, written by Jennifer Lach

Combat Global Warming through Sustainability

The United States is considered a global leader when it comes to technological advances, economic and military power. Unfortunately, we are also a leading producer of garbage. The United States produces more municipal solid waste per person than any other country. This depressing statistic largely stems from our reliance on disposable products. Although the plastics industry has brought many important advances in the areas of insulation, packaging, medicine, weaponry, etc, the versatility and cost-effectiveness of plastic has also led to a boom in disposable products. Disposables, albeit convenient for citizens on-the-go in this fast-paced society, have exponentially increased the amount of garbage we produce.

Plastic is made of petroleum and natural gas, two dwindling natural resources. When plastic products are thrown in the trash, the majority ends up in landfills, where they comprise 25-30% of space in this nation’s overflowing landfills. Because plastic takes hundreds to thousands of years to decompose, its presence in landfills is basically the equivalent of buried energy. It also makes it more difficult for organic compounds such as food waste to decompose.

Because plastic is not carbon neutral, burning it contributes to global climate change and also emits toxic particulates into the atmosphere. Global climate change is not a theory, it is a reality. Therefore, it is the responsibility of every human being to try and slow this devastating global trend. Plastic may not first come to mind when you think of how to target global warming, but decreasing plastic usage is actually an excellent, easy way that consumers can minimize their carbon footprint. After all, recycling of plastic has been stressed in the recent “go green” trend in society, but despite the hype, only 5% of all plastic products are currently recycled in the United States. Thus, Americans as a whole could really make a difference by boosting this statistic. Of course, because recycling does not provide a 100% return on energy, it really needs to be supplemented with source reduction.

Source reduction, which means to decrease the amount of products created in the first place, is truly the most sustainable option for dealing with the problem of municipal solid waste, the dwindling oil supply, and hence, global warming. Two current “epidemics of consumerism” now have many environmentally-friendly alternatives, which have the power to significantly
reduce the amount of plastic waste that this country generates. The water bottle industry is extremely energy intensive, between packaging and shipping, since plastic water bottles are made from oil. Other countries, such as Finland and Denmark, certain U.S. cities, such as San Francisco and Chicago, and various universities, such as University of Maryland and Washington University, have all taken the pledge to ban this unnecessary item. Although the United States’ federal government has not made this leap, reusable water bottles made of aluminum are becoming more and more common, at reasonable prices.

The other “epidemic” that has recently received a good deal of attention is plastic bags. Plastic bags are not commonly recycled, they have a poor return on energy when they are recycled, and they take hundreds of years to decompose in landfills. Various countries have banned or placed limits on the use of plastic bags, including Australia, Ireland, and Taiwan. Such policies do not exist in the United States on a federal level, but many options now exist for reusable bags, which are commonly sold in grocery stores and various other chain stores. Customers can even now find reusable bags that roll up into tight, compacted carriers so that they can easily be stored at the bottom of a purse or in a glove compartment.

Universities across the country are at the cutting edge of becoming more sustainable and decreasing their plastic production, whether it is by promoting reusable bags, banning disposable water bottles, providing water filter stations, promoting recycling programs, etc. Rutgers University in New Brunswick has started a campaign in their dining halls to decrease the amount of disposable plastic waste generated by take-out. The Boomerang Box is a reusable container that students can use for their entire time at Rutgers when they get take-out, instead of using a throwaway plastic or Styrofoam container. I hope some readers might consider what small steps they could make in their own lives. For, by simply choosing an aluminum water bottle instead of a disposable one, or a reusable bag over a plastic bag, any individual can easily decrease his/her carbon footprint, and also make this country a cleaner, more sustainable place to live.

Op/Ed Article- sent to The Times of Trenton, written by James Preisendanz
March 23, 2009

Dear Editor:

Plastic has become one of the most popular materials for packaging and main stream products that Americans use in everyday life. Most people probably do not take the time to examine the amount of plastic products that have become integrated in their house alone: electronics, appliances, apparel, furniture and hygiene products to name a few. Outside our homes plastic has also become widely used in the production of automobiles, cell phones, bottled beverages, packaged “on the go” food items and plastic bags at shopping centers.

The wide usage of plastic has also increased the amount of “single use”, disposable products, which have become popular due to their convenience. Items that can be used and then simply thrown away can be appealing, but disposal of plastic is wasteful and harmful to our air and water quality. After we throw away plastic in the garbage instead of the recycling, it winds up in a landfill where it can remain for thousands of years. As the plastic slowly decomposes, toxic chemicals leech into the soil, diffuse into the air and can even get into our drinking water in municipalities that rely on aquifers as their main water source. The other means of disposing plastic is through incineration where it is burned in large quantities releasing harmful greenhouses gases such as carbon dioxide and methane into
Littering is a serious offense which is many times associated with impoverished communities where people are uneducated and do not have the resources to maintain a clean environment. The presence of plastic waste can degrade aesthetic appeal and property value. Polluting our physical landscape with plastic material does not remain on land. Run off during rain periods wash plastic into rivers, streams and into our sewer lines which all ultimately flow into the ocean. The ocean covers approximately 70 percent of the earth’s surface, and therefore plays a significant role in the climate and ecological balance on land. The Plastic North Pacific Gyre is a continuous current where it is believed that approximately 10 tons of plastic and other municipal waste have accumulated.

Fortunately, many companies and institutions have become aware of the problem and are making progressive efforts to be more environmentally responsible. Rutgers University has won Recyclemania for several years against Princeton as our main competitor. Kevin Lyons, a member of the green purchasing department makes a tremendous effort to require companies we purchase from to have a sustainable recycling program. For example, all the computers that are no longer in use are sent back to the manufacturer where many parts are reused or properly disposed of. Despite Rutgers’ ecologically friendly reputation, plastic is still used in our dining halls for: trays, silverware, plastic bags, styrofoam cups and containers for takeout. Rutgers dining services currently spends 1 million dollars on plastic annually. By eliminating disposable plastic containers for takeout, Rutgers could make a significant improvement by lowering costs and being more environmentally responsible. The solution that is currently in practice is the use of boomerang boxes which are re-usable containers for takeout. Each boomerang box costs $5.00 for students as a one-time flat fee for an entire academic year. However, many students do not use the boomerang box since they view it as “less convenient”, but as long as students return the box, dining hall employees wash it for them. Another problem is that the boomerang boxes are not advertised well so perhaps most students are not even aware of its existence. Hopefully the purchasing department for dining services will take the situation very seriously and make this service more available or even a requirement.

Increasing awareness of the harmful affects the creation and improper disposal of plastic has on the environment will be ultimately become the first step in solving the problem. My generation along with all future generations will begin to accept the wide usage and disposal of plastic as the norm. Unless we provide alternatives to plastic or simply begin to reduce the use of plastic entirely, the negative affects plastic will continue to plague our earth.

Appendices

Proposal to Reduce Plastic Waste in Dining Hall Take-Out

Sent to: P. Charette: Associate Director Cash and Catering Operations
Sent to: Kevin L. Lyons: Executive Director Procurement Services
Sent to: Charles P. Sams: Executive Director Dining Services

Dear ________,

Disposable products have become almost an epidemic in today’s society. The United States produces more municipal solid waste per person than in any other country, largely due to Americans’ reliance on plastic disposables. Because only 5% of all plastic is recycled in this
country, the majority ends up as waste, taking up 25-30% of space in landfills. Since plastic is made from oil, a nonrenewable resource, it is not carbon neutral; therefore the combustion of plastic contributes to global climate change.

Rutgers University does have an admirable recycling program, and actually recycles all seven types of plastic. Unfortunately, the disposable containers used in dining hall take-out are made out of type 6 plastic. The higher numbers of plastic yield a low return on energy, even when recycled, which is why source reduction of these products is the most environmentally friendly option.

Our proposal for Dining Services is to try and decrease the amount of plastic disposables used in take-out at the dining halls on all four campuses. One idea is to simply stop providing disposable plastic/Styrofoam containers in take-out and instead make the Boomerang Box policy mandatory. The $5 fee for the Boomerang Boxes could be added on to the freshman meal plan, since all incoming students are required to purchase a meal plan. Dining Services could even consider selling the boxes to students for cost, so that students would only be charged $2.50 for a box. Regardless, this is a very small one-time fee, seeing as the Boomerang Box is available to students for their entire time at Rutgers.

If you feel that this first idea is too drastic, then consider instituting a rewards program to encourage students to use the Boomerang Boxes, without actually making the boxes mandatory. For instance, a sample program could award students points for the following environmentally friendly actions:

- Return plastic bag to take-out ½ point
- Bring reusable bag to take-out 1 point
- Bring Boomerang Box to take-out 1 point

At the end of each semester, a raffle could be held for a prize. The more points a student accumulates over the course of the semester, the greater his or her chance of winning the raffle. Points could possibly be recorded on students’ RU Express cards, just like rewards cards used at different stores (i.e. Borders). Hopefully this system would encourage students to purchase a Boomerang Box, so that over time, disposable boxes could be phased out.

One of the main issues regarding the Boomerang Boxes is that they are not advertised well so most students are not aware of their existence. Therefore, we are also proposing that an environmental organization on campus, like Students for Environmental Awareness, could write an informative flier about the Boomerang Boxes. The flier would explain how the Boomerang Boxes work and describe the environmental benefits that would result from their use. Many students believe that the Boomerang Box is inconvenient, but by raising awareness of how this service can save money and help the environment, hopefully more students will be inclined to purchase one.

We liked the idea of encouraging students to cut down on plastic bag waste as well. A plastic bag receptacle could be placed at the start of the take-out line in each dining hall, where students swipe their RU Express cards. Students could return their used plastic bags to the receptacle, and a Rutgers employee could then bring the bags to the local Acme or Wal-Mart store as needed. Both of these stores accept plastic bag drop-offs from consumers and businesses, and then send all the plastic bags to a recycling plant.

Although this second idea would require certain start-up expenses, it would save money over time if students did begin to use reusable products, seeing as Dining Services currently spends $1 million on plastic disposables each year. In addition, either of these ideas would aid Rutgers on
its quest to being a truly green institution. We hope you consider one of our suggestions. Please feel free to contact us with any comments. Thank you.

Sincerely,

Jennifer Lach

James Preisendanz

Kevin Lyons’ Response (email)

Excellent proposal and write-up ... well done!

However, as I have told students in past years ... Dining Services operates as a separate procurement operation to deal with food and related purchases. Therefore, they have been given authority to make the changes you are proposing. I can certainly support your work and help as much as I can. So, the only change I would make would be the audience (target) to which your proposal should be addressed.

If you wanted to start at the top: Dr. Greg Blimling (VP Student Affairs); Dining Services is under his authority

Charlie Sams, Director, Dining Services (Mr. Sams reports to Dr. Blimling).

This should get the ball rolling and I am pretty sure I'll hear about this proposal again ... because you should think about copying higher ranked deans and administrators if you want to see some real action (just a suggestion).

KL

Charlie Sams’ Response

As a proposal I see merit in areas. Just be certain all your facts are correct. For instance, only students in residence halls are required to have meal plans; there are many non-residence hall students (not quite half of all students with board plans) that are either commuters, apartment residents or living off-campus.

Historically it has been virtually impossible here at RU to “mandate” or require any number of students, and especially “all”, to do anything. Requiring students to pay more and receive a “Boomerang Box”, would most likely have to be part of the annual fee proposal RUDining sends to the Board of Governors. Not so sure that would fly, but as a proposal idea, it’s fine.

In addition, the Boomerang Box was advertised at all Dining and Take-out locations as we began the fall semester. Response was minimal and usage even less. Students indicated that it was
“inconvenient” and not “realistic” to be expected to return the box and receive the new, cleaned and sanitized one.

To me at issue here is the desire and willingness of the student population to make a difference. To date, they have chosen the lesser path. CS