

Spring 2016

Reducing Sarah Lawrence's Use of Plastics

Marisa Acosta
Sarah Lawrence College

Victoria Brown
Sarah Lawrence College

Hannah Lawson
Sarah Lawrence College

Follow this and additional works at: http://digitalcommons.sl.c.edu/undergrad_sustainproject



Part of the [Sustainability Commons](#)

Recommended Citation

Acosta, Marisa; Brown, Victoria; and Lawson, Hannah, "Reducing Sarah Lawrence's Use of Plastics" (2016). *Campus Environmental Sustainability Project*. Book 3.
http://digitalcommons.sl.c.edu/undergrad_sustainproject/3

This Book is brought to you for free and open access by the Undergraduate Scholarship and Creative Works at DigitalCommons@SarahLawrence. It has been accepted for inclusion in Campus Environmental Sustainability Project by an authorized administrator of DigitalCommons@SarahLawrence. For more information, please contact alester@sarahlawrence.edu.

Reducing Sarah Lawrence's Use of Plastics

Marisa Acosta, Victoria Brown & Hannah Lawson

Environmental and Human Health Concerns

In the U.S. in 2008, 34 million tons of plastic were thrown away, 86% of which was placed in landfills¹. As plastics break down, chemicals leach, generating greenhouse gases and air pollutants. These chemicals can alter the development of children and threaten the lives of wildlife².

Waste-Reduction Initiatives on Other College Campuses

SUNY at New Paltz eliminated plastic bag waste by removing plastic bags as an option and instead sold reusable canvas bags for \$1. They also removed disposable cups from their facilities.

Dartmouth College and Mt. Holyoke eliminated disposable cups by completely removing disposable cups. Instead, they sold reusable water bottles for \$5. They also gave reusable water bottles to all freshmen.

Emerson College offered reusable food containers for a one time fee of \$5. They then charged \$0.50 for every non-reusable container that was purchased. They used a token or 1card system to give credit when the containers were returned for cleaning.

Current Take Out Container Policies at SLC

The Pub offers a discount to students who bring their own travel mug.

Bates dining hall offers a reusable container for \$1, that is refunded if returned.

These options need to be publicized more, as most students are unaware of these options.

Figure 1: Plastic tubs are thrown away in excess every day at SLC. Many plastics are mistakenly put in the trash instead of recycled.



Figure 3: Storage space for the non-reusable plastics could be replaced with reusable containers or opened up for other types of storage.



Reusable Containers on SLC Campus

Eliminating plastics at SLC will provide financial benefits for SLC, reduce plastic in landfill, safeguard the health of students, and protect the surrounding environment.

One strategy to raise funds is giving student the option to donate excess meal swipes and meal money at the end of semester to a Greener Campus Fund. The school could also solicit alumni support. Another way to raise money would be taxing non-reusable containers for \$0.50 each or more.

Figure 2: Multiple OZZI machines across campus would be used to collect containers.



Bibliography

1. North, Emily J. and Rolf U. Halden. 2013. "Plastics and Environmental Health: The Road Ahead." *Review of Environmental Health* 28 (1): 1-8.
2. Talsness, Chris E., Anderson J. M. Andrade, Sergio N. Kuriyama, Julia A. Taylor, and Frederick S. vom Saal. 2009. "Components of Plastic: Experimental Studies in Animals and Relevance for Human Health." *Philosophical Transactions of the Royal Society B* 364 (2009): 2079-2096.

Implementing the Reusable Container Program

Distribute

Students pay a small fee of \$5 at the start of the semester.

Clean

Students could turn in containers at Bates or the Pub. Alternatively, the OZZI system provides automated machines to placed around campus, allowing students to deposit their dirty container and receive credit. With either system, the containers would be collected and washed at Bates.

Redistribute

A token or credit on 1card would be used to pick up a clean container.

Reducing Sarah Lawrence's Use of Plastics

Marisa Acosta, Victoria Brown, & Hannah Lawson

In the United States in 2008, 34 million tons of plastic were thrown away, 86% of which was placed in landfills (North and Halden 2013). Sarah Lawrence College uses 50,000 plastic containers per school year, contributing 1.5 tons of plastic per approximately thousand people. If everyone in New York City discarded plastic takeout containers at the same rate, they would produce 126,000 tons of plastic waste yearly. This discarded plastic is not only incredibly wasteful, but poses significant environmental and human health risks. This paper seeks to evaluate the damages and costs of plastic waste and to formulate a plan to reduce this waste on the Sarah Lawrence campus. In the first section, the paper addresses the hazards of plastic. In the second, it explores waste-reduction programs at other schools. Thirdly, it evaluates Sarah Lawrence's current policies on plastic. In the final section, the paper explores potential waste-reduction solutions for Sarah Lawrence. After evaluating the aspects of plastic, it concludes that the most salient policy response is to institute a reusable container system.

Plastic compounds can be found in everyday products such as medical devices, cosmetics, computers, children's toys, and food packaging (Oehlmann et al. 2009). However, despite the usefulness of plastics, they pose severe negative effects on both human health and the natural environment. Many of the chemicals in plastic are toxic (Thompson et al. 2009); phthalates and bisphenol A (BPA), two of the most common plastic chemicals, are produced worldwide in quantities exceeding 1 million tons each year (Koch and Calafat 2009). Detected in the air, dust, and aquatic environments, (Thompson et al. 2009) these chemicals directly enter environmental cycles and the human body (Koch and Calafat 2009). Phthalates and BPA have serious impacts on

humans and other animals, including alteration of the endocrine system, anti-androgen action, disruption of thyroid hormone homeostasis, the alteration of gene expression cells, and testicular dysgenesis syndrome. Concentrations of these chemicals far exceed healthy levels in young children and have been proven to alter the development of their brains (Talsness et al. 2009). Strikingly, the chemicals in plastic affect children most.

Polybrominated biphenyl ethers (PBDE) have been found in breast milk and fat tissue, leading to a higher exposure in young children (Talsness et al. 2009). Oehlmann et al. (2009) demonstrated that phthalates and BPA can affect reproduction, cause genetic aberrations, and impair development. It has also been found that endocrine disruptor chemicals (EDCs), could contribute to the development of cancer, reduced sperm count in humans, and precocious puberty in females (Talsness et al. 2009).

Exposure in humans and animals is a direct result of exorbitant waste. Chemicals leach out of discarded plastic and contaminate the surrounding environment (Talsness et al. 2009). There are several concerns about disposal: one of the most pressing problems involved in plastic products is the mass accumulation of waste in natural habitats and landfills. Landfills are quickly reaching or have reached capacity (Thompson et al. 2009). Discarding plastics in landfills is unsustainable because as the products break down, they leach chemicals, generating greenhouse gases and other air pollutants, which are very harmful to the environment and contribute to global warming (North and Halden 2013).

Another hazard of plastics is their danger to wildlife. Improperly discarded plastics are often discovered by animals who may consume or become entangled in the plastics. When animals ingest plastic products, the toxins are cumulative and can snowball up the food chain, only multiplying the negative effects. Our current plastic disposable practices

contaminate freshwater, marine, and natural terrestrial habitats (Thompson et al. 2009). Bisphenol A is often released through landfill discharge, sewage treatment plants, and water systems and is found regularly in aquatic ecosystems, (Oehlmann et al. 2009).

Initiatives on other college campuses provide us with models for implementation on the Sarah Lawrence campus. This section aims to draw ideas for a program structure at Sarah Lawrence from the programs at other schools.

There were three schools in our study sample who instituted programs that, although they targeted different sources of waste, utilized models that can be applied to a program at the college. State University of New York at New Paltz eliminated plastic bag waste at their school bookstore in two simple steps: removal of waste products and presentation of alternative. They ceased to offer plastic bags with purchases at the school store and began selling reusable canvas bags for \$1 each. These bags could be used by the students for other purposes or redeemed for their \$1 back at any time. The upfront cost of the program is relatively low and requires only the purchase of canvas bags. It is a self sustaining program that will very quickly begin to pay for itself: the cost of canvas bags is a one time investment while the continued purchase of plastic bags is no longer necessary. The system is self sustaining because canvas bags are returned or reused by students without the need for continual repurchase. An additional potential benefit is that the lack of plastic bags on campus may condition students to use reusable bags for other purchases off campus.

The other two schools, Dartmouth College and Mt. Holyoke, both instituted programs to eliminate disposable cups on campus. At Dartmouth, reusable water bottles were sold for \$5 to student from a table in the main dining hall. The table also provided

information on the financial, environmental, and health benefits of a reusable water bottle. Mt. Holyoke gave all students reusable bottles at freshmen orientation (for use all four years of school) and removed disposable cups from their dining services. Annually, the college saves over 81,650 cups from the landfill (about \$5,000). Dartmouth College placed the price of waste reduction on the students, making the program optional while Mt. Holyoke internalized the cost of the program by providing the water bottles for free. By removing disposable cups, the college made all students participants—if they forgot their bottle, they would have to go thirsty—but, in doing so, created change on a larger scale.

One college, Emerson College, began offering reusable food containers for a one-time fee of \$5. Contemporaneously, students were charged 50 cents for every non-reusable takeout container they used. A table was set up in the dining hall where students could return their used container in exchange for a new container or a token to pick up a new container the next time they purchase takeout. Emerson's model incentivizes reusable container use by adding a considerable cost to disposable containers: even if a student got take out as infrequently as once per week, with an average school year of 34 weeks, they would spend \$17 per year, more than triple the cost of the \$5 fee.

The downsides of a reusable takeout container system are, most prevalently, the issue of compliance and the infrastructure to clean and redistribute new containers. The token system—which ensures that students only receive one container at a time—prevents a loss of containers while the 50 cent cost incentivizes compliance. Additionally, there are companies that provide services to make the transition and compliance easier. OZZI provides a ready-made system for recycling reusable containers. Large black machines

placed around the campus provide an easy, automated return system, allowing students to return their containers for a token, which can be used for another container later on. In lieu of a token, a card reader can be used to return credit to student ID cards, putting meal payment and the reusable container system on the same card. A number of campuses including University of Maryland College Park and the University of California use the OZZI system.

Our current use of plastic is not sustainable (Thompson et al. 2009). Studies show that using a reuse-recycle program for plastic based products can significantly decrease negative environmental impacts (Ross and Evans 2002). However, recycling plastic creates problems such as effective sorting (North and Halden 2013), as we often see at Sarah Lawrence College. The use of biodegradable plastics is sometimes used as an alternative, however this “solution” only creates competition for food supply, as these plastics use resources such as corn and molasses (North and harden 2013). Integrating the use of paper- based and reusable containers at Sarah Lawrence College could be one of the first steps towards a more sustainable and healthy future.

Efforts to reduce plastic on campus have been on the back burner for a while now. Lacking specific data, this section reviews current systems in place at the college and brainstorms methods of raising money for a transition to less wasteful containers in the future. Students could be given the opportunity to “round up” when they make a purchase at the Pub and the extra money could be used to offset the increase in price for the eco-friendly containers. This would be optional so students would have no reason to feel gouged or forced to comply with something they did not agree in. This could be implemented for a set period of time with a specific fundraising goal. This could prove to

be a successful method of raising the money, which would also prove that this is something the students are truly passionate about.

The Pub does give discounts to students who bring their own travel mugs when purchasing a beverage. This discount is not something that is particularly known by the students. Similarly, Bates dining hall has a to-go system at Sarah Lawrence. Most students know that you can ask for a to-go container (the same clear-hinged plastic ones available at the Pub), fill it, and leave. Many students do not know that there is another to-go option. For an upfront fee of one dollar, students can borrow a reusable to go container that can be returned for a full refund after they are finished. This program is, in effect, a much smaller scale of the larger reusable container program. Because most students are unaware of these programs, they are rarely used, if the program was more widely publicized, it could be more successful. Additionally, if students disposable drinking cups were only kept behind the counter, where students need to ask for them, students may become more mindful about their cup usage and may decide to transition to a reusable mug as an easier option.

Alternatively, students are less likely to buy into the reusable container system when a free option is available, regardless of the environmental costs. The system would be most beneficial if it was the only option offered. Fortunately, the staff at Sarah Lawrence is willing to commit to make the transition to the reusable container program if enough students demonstrate support. Assuming that the support for this system exists, Sarah Lawrence would solely offer a reusable to-go container at Bates. The student could pay the \$1 fee with meal money, 1card, or cash.

There are several environmental benefits to implementing the use of reusable and paper based containers. By eliminating the use of plastic containers, Sarah Lawrence will be doing its part in protecting the environment. By doing so it will reduce plastic in landfills, create a more sustainable system, and safeguard the health of the students and the surrounding environment. Especially with hot foods, chemicals in the plastic tubs can leach into the food in the container and directly enter the student's body. This is very dangerous and can lead to the numerous health problems that are covered in more depth in the first section. Other chemicals can actually release into the air and dust around us, further affecting the environment and other students. By eliminating the use of plastic containers, Sarah Lawrence College would ultimately be benefitting in the form of a healthy student body and a healthy environment.

While there would be many environmental benefits, eliminating plastic from the campus could have financial benefits as well and the transition to a more eco-friendly campus could incentivize possible donors. Many college campuses, like those mentioned earlier in this paper, have begun enacting green initiatives and receiving positive feedback. Sarah Lawrence could highlight these initiatives in press releases, lead to an increase in donations.

While a reusable container program may be financially beneficial in the long run, facilitating the transition to a reusable system can be financially daunting. By using the economic model of Pigouvian taxes, fundraising tactics, and/or eliminating other options, the school and AVI can make the transition smoother and ensure students are invested in the program.

Foremost, AVI has expressed concern about the additional costs of a reusable or compostable container program. Thus, creating a system that does not require additional investment on the part of either the college or AVI is the most surefire way to be successful. There are a number of options to achieve this goal. First, students could be given the option to donate their excess meal swipes and meal money at the end of the semester to a Greener Campus fund. This fund could be invested in financing green projects around campus included, but no limited to, the reusable container program. Alternatively, in the checkout line, students could be asked in the checkout line whether they would be willing to donate \$1, \$5, or \$10 amounts to the reusable container fund and the money could be easily transferred from their 1Card or Meal Money to the fund. Another alternative is to solicit an alumni supporter to supply the upfront costs of containers. For any of these options, a Pigouvian tax of fifty cents (or similar) could be implemented on all non-reusable containers used by students once the program is running. Combining the tax with promotional literature and information on the ongoing monetary and environmental costs of the disposable containers can not only finance the program but also increase students' likelihood of compliance.

Implementing a reusable container program would be very beneficial both financially and sustainably for Sarah Lawrence College. The issue of how to distribute, clean, and redistribute the containers is easily solved with simple planning. Students could have the option of turning in their containers to be cleaned either in the Pub or at Bates Dining Hall. When they are turned in to the Pub, a bin could be designated for the containers that would be taken down to Bates once or twice a day, depending on the frequency of returns. Likewise, bins would be set up at Bates, where the containers could

then be washed once a day. The cost of transporting these bins can be easily rationalized. Assuming that most cafeteria employees receive near minimum wage, about \$9/hour, the twenty minutes required to transport the containers would cost the college about \$3, if this task is performed once a day, seven times of week for the average 12 weeks in a semester, it would cost approximately \$250 to pay an employee to transport the used containers each semester. This cost is but a fraction of the \$3,750 spent on disposable plastic containers each semester. Employees could transport the used containers to Bates Dining Hall 15 times a day (or for five hours!) before the cost of transporting containers was equivalent to the cost of disposable ones. Even with the time required to clean the containers, reusable containers would undoubtedly be less expensive in the long run.

The containers would be redistributed by way of a token or a credit on the 1Card. This credit or token would be given when a container is returned and taken off when a cleaned container is picked up. Sarah Lawrence College has the resources and ability to become more sustainable and environmentally conscious by making small moves such as switching over to reusable containers.

A reusable system would be most beneficial if it was the only option offered. Fortunately, the staff at Sarah Lawrence is willing to commit to make the transition to the reusable container program if enough students demonstrate support. Assuming that the support for this system exists, Sarah Lawrence would solely offer a reusable to-go container.

Due to the fact that using compostable containers is not a viable option for Sarah Lawrence's campus, this paper concludes that a reusable container program is the best *modus operandi* for reducing plastic waste on the college's campus. Not only will the

program reduce the amount of plastic being discarded, but will actually save the college money. With a single overhead cost, minor employee upkeep costs, and a positive impact on the environment, instituting a reusable container system at Sarah Lawrence is a low-cost and relatively easy step that benefits both the environment and the college.

Bibliography

Koch, Holger M. and Antonia M. Calafat. 2009. "Human Body Burdens of Chemicals Used in Plastic Manufacture." *Philosophical Transactions of the Royal Society B* 364 (2009): 2063-2078.

North, Emily J. and Rolf U. Halden. 2013. "Plastics and Environmental Health: The Road Ahead." *Review of Environmental Health* 28 (1): 1-8.

Oehlmann, Jörg, Schulte-Oehlmann, Werner Kloas, Oana Jagnytsch, Ilka Lutz, Kresten O. Kusk, Leah Wollenberger, et al. 2009. "A Critical Analysis of the Biological Impacts of Plasticizers on Wildlife." *Philosophical Transactions of the Royal Society B* 364 (2009): 2047-2062.

Ross, Stuart and David Evans. 2002. "The Environmental Effect of Reusing and Recycling a Plastic Packaging System." *Journal of Cleaner Production* 11 (2003): 561-571.

Talsness, Chris E., Anderson J. M. Andrade, Sergio N. Kuriyama, Julia A. Taylor, and Frederick S. vom Saal. 2009. "Components of Plastic: Experimental Studies in Animals and Relevance for Human Health." *Philosophical Transactions of the Royal Society B* 364 (2009): 2079-2096.

Thompson, Richard C., Charles J. Moore, Frederick S. vom Saal, and Shanna H. Swan. 2009. "Plastics, the Environment and Human Health: Current Consensus and Future Trends." *Philosophical Transactions of the Royal Society B* 364 (2009): 2153-2166.