# The Trayless Dining Movement and the University's Future Transition


## Jacquelyn Pearlmutter and JR Mastro

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## Introduction

Across the globe, and in the United States, food waste causes negative financial, environmental, and social impacts (Plano, 2016). At the United States retail and consumer level, 90 billion pounds of food are wasted each year, which is equivalent to $161.6 billion annually (Plano, 2016). More than 50% of waste is diverted to landfills where the organic matter contaminates soil and groundwater, decomposes, and produces methane (Lopez *et al.*, 2016). Methane, a greenhouse gas, is more potent than CO2 as it traps 25 times more radiation than CO2 (Lopez *et al.*, 2017).

## Background/Literature Review

In 2017 Richmond committed to being a "leader in innovative practices that sustain our environmental, human, and financial resources" (Strategic Plan, 2017). Rhodes University in South Africa found the average waste generated by one student across three meals is around 555±107g. They also concluded that a simple educational message can "reduce food waste by up to 14%" (Painter *et al.*, 2016: 492). Colgate was able to reduce water usage, energy usage, and food waste by going trayless (Burgett *et al.*, 2011). The main obstacles faced by Colgate were cost and student approval. Cost became a non-factor as the collection system needed to be renovated, and the majority (47%) of students would found to agree, 20% were found to be neutral, and only 33% were found to disagree with trayless dining (Burgett *et al.*, 2011). Colgate has estimated annual savings of $100,700 and reduced 2 metric tons of $CO_2$ from 2011-2015 (Food and Dining, 2015).

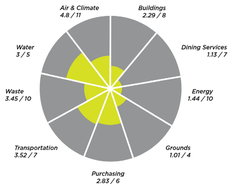


**Figure 1: Sustainability Scores at the University of Richmond** (Rob Andrejewski, Richmond's Sustainability Report, 2017).

## Methods

**Dining Hall:**

- Conducted interviews to learn about the changes on trayless dining days
- Analyzed food waste data on trayless and non-trayless days

**Other schools:**

- Analyzed dining programs at top 30 liberal arts colleges with special attention to benefits and drawbacks of trayless systems and process of transitioning to trayless


**Figure 2:** Dishroom at Heilman Dining Center and pulper that compacts waste (JP, 2017).

**Figure 3:** Glorified Washing Machine that fits trays and plates (JP, 2017).

## Results

| The Trayless Dining Transition Among the Top 30 Liberal Arts Colleges | | |
|---|---|---|
| **Rank** | **Name** | **Trayless Program** |
| 1 | Williams College | YES |
| 2 | Amherst College | YES |
| 3 | Wellesley College | YES |
| 4 | Middlebury College | YES |
| 5 | Swarthmore College | NO |
| 6 | Bowdoin College | YES |
| 7 | Carleton College | YES |
| 8 | Pomona College | YES |
| 9 | Claremont McKenna College | YES |
| 10 | Davidson College | NO |
| 11 | Washington and Lee University | YES |
| 12 | Colby College | YES |
| 13 | Colgate University | YES |
| 14 | Hamilton College | YES |
| 15 | Haverford College | YES |
| 16 | Smith College | YES |
| 17 | Naval Academy | NO |
| 18 | Vassar College | YES |
| 19 | Grinnell College | NO |
| 20 | West Point | NO |
| 21 | Harvey Mudd College | YES |
| 22 | Wesleyan University | YES |
| 23 | Scripps College | YES |
| 24 | Colorado College | YES |
| 25 | Macalester College | YES |
| 26 | Oberlin College | YES |
| 27 | Barnard College | NO |
| 27 | Bates College | YES |
| 27 | Kenyon College | YES |
| **27** | **University of Richmond** | **NO** |

**Figure 4. Dining at the top 30 liberal arts colleges.** 77% of top 30 colleges/universities have transitioned to trayless dining

Findings:

- About 2-2.6 oz of waste is produced for every tray
- Average of 3,687 customers daily at the dining hall

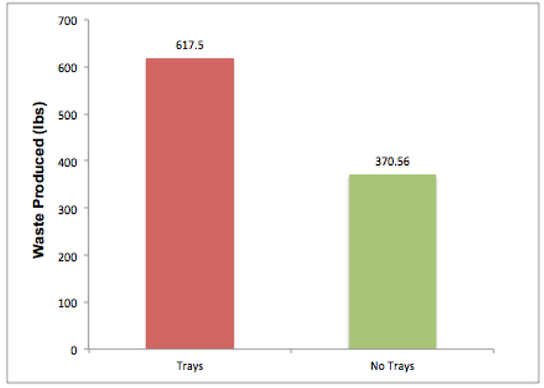


**Figure 5: Trayless dining events at the University of Richmond.** Average food waste produced on nine trayless dining events during the academic school year of Fall 2015 through Spring 2016

## Conclusions

**Why Colgate went trayless?**

- Burgett et al. (2011) found that water must be heated to between 140°F to 160°F to sanitize trays, which requires a significant amount of energy
- Without trays, the dishwasher runs less frequently creating energy savings
- Burgett et al. (2011) estimates that 1/3 of a gallon of water is needed to clean a tray and up to 12,075 gallons per year are saved by going trayless
- Applying these water savings per tray to Heilman Dining Center, this equates to 1,229 gallons of water per day that could be saved by eliminating trays
- Burgett et al. (2011) estimates that on average, schools that have transitioned to trayless dining have experienced a 30% reduction in waste

**Heilman Dining Center:**

- On average there is a 40% reduction in waste on trayless days
- In the long term, this would create a reduction in food acquired, prepared, and disposed
- The University would save an average of 51,857.4 lbs of food waste in an academic year (210 days) by going trayless

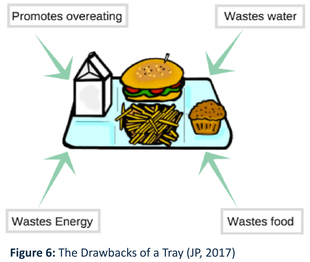


**Figure 6:** The Drawbacks of a Tray (JP, 2017)

## Recommendations

**Why we recommend trayless dining?**

- Have trayless dining poster in the dining hall on each table during the 1st semester of transition

**- Positive aspects:**

- School status- Shows commitment to school values and aligns with other top 30 liberal arts colleges
- Global impact- Addresses environmental, social and economic issues by reducing food waste and promoting sustainability
- Education components for students- Will teach students the depth of waste issues and ways they can be active citizens by building off this project to reduce waste
- Food, water, energy reductions

**- Overcoming cons**

- Negative Student Perception- Incorporate at the beginning of a school year and incorporate an educational component at orientation to explain why the University is trayless
- Cost of changing Heilman- The University has plans to renovate the Heilman; like Colgate, incorporate trayless with renovations (Burgett *et al.*, 2011)

**- Future studies:**

- Surveys to find student and faculty stance on going trayless
- Economic analysis of energy and water savings similar to Colgate
- 2 week trayless pilot program to solidify savings and reductions
- Continue to explore options outside of trayless dining


**Figure 7: Trayless dining poster for Heilman Dining Center.** This poster could be used to ease transition to trayless dining (JP, 2017).

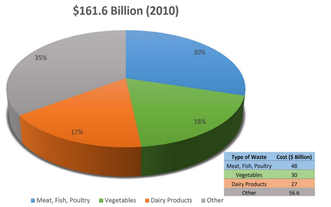


**Figure 8: U.S. Retail Food Waste in Dollars. In 2010, $161.6 billion worth of food was wasted** (*Retail Food Waste in the U.S.*, 2016).

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