Simple and Smart Designs Save: Dining Hall Trays Affect Energy Consumption

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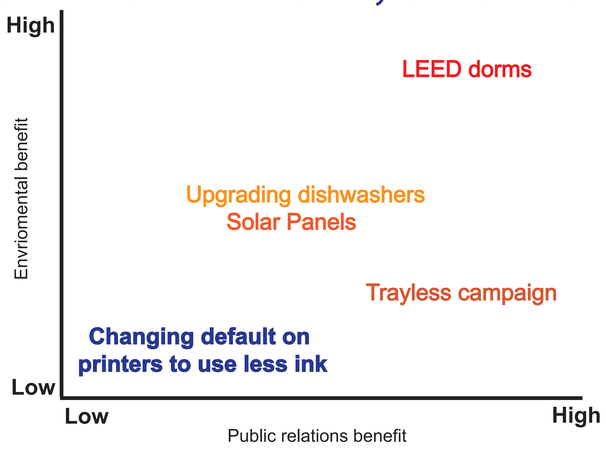
Abstract

Tray-use in dining halls has been linked to higher energy, food, and water consumption. Trays are collected by continuously running conveyor belts, require heated water to clean, and allow diners to take more food than they consume. Trayless dining campaigns at other universities have lowered resource consumption rates while increasing student body awareness of environmental issues. A trial period of two weeks of trayless dining was completed at the Carmichael Dining Hall between March 28, 2010 and April 9, 2010. During this period energy consumption and food waste were evaluated by weekly meter readings made available by the Tufts Energy Management office and by detailed three day audit reports given to Tufts Dining Services by the composting company "Save that Stuff". We have shown that the Trayless pilot program at Tufts has not only conserved resources, but has also influenced student body perceptions of environmental initiatives.

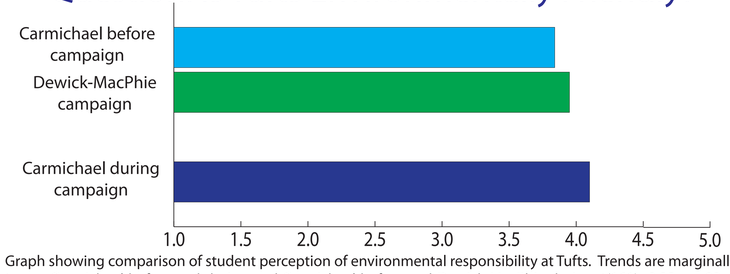
Approximate PR and Environmental Benefits of Various Environmentally Conscious Changes



Introduction

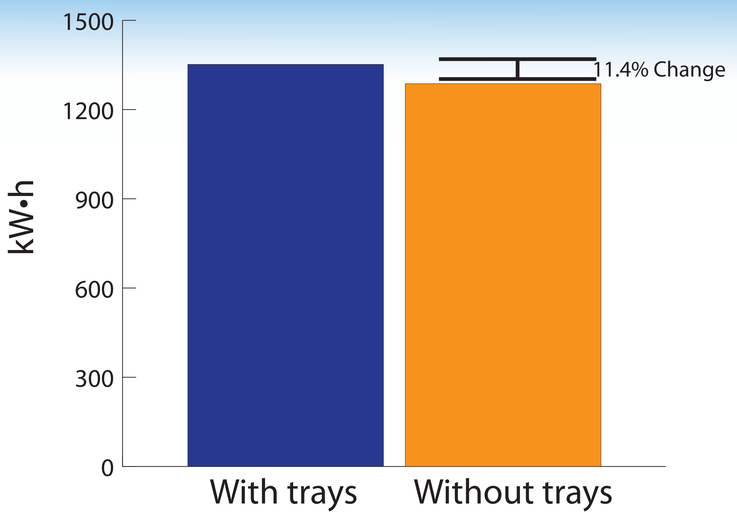
In 2009 the facilities at Carmichael Dining Hall composted 24.28 tons of food waste, used 365,520 kW•h of electricity, and consumed an average of 450 gallons of water per day for the dishwasher. We have predicted that a trayless campaign could conserve moderate food, electricity and water resources. While Tufts University has been a leader in sustainable university practices, sentiments of environmental stewardship seemed uncharacteristically low on campus. By implementing the trayless campaign, it was further predicted that a change in personal environmental attitudes and perceptions of Tufts as an environmental institution would occur.

Question: Is Tufts Environmentally Friendly?



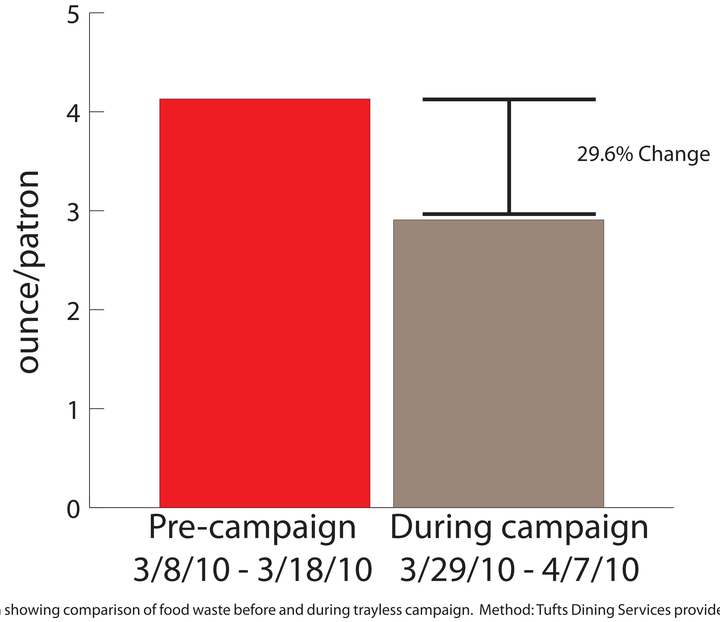
Graph showing comparison of student perception of environmental responsibility at Tufts. Trends are marginally significant between Carmichael before and during and Carmichael before and Dewick-MacPhie during, $t(161)=2.32$, $p=.02$ and $t(198)=1.73$, $p=.09$ respectively.

Average Energy Consumed Per Day



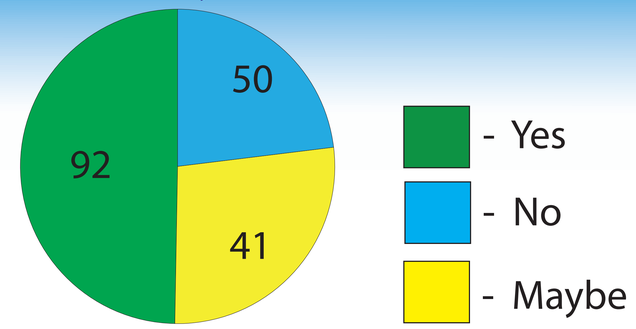
Graph showing comparison of energy consumed before and during trayless campaign. Method: Tufts Energy Manager provided weekly energy meter readings for Carmichael Dining Hall from March 19, 2010 through April 9, 2010. Pre-trayless daily averages from April 2009 were calculated and compared with trayless daily averages.

Average Food Waste Per Person (10 Day Period)



Graph showing comparison of food waste before and during trayless campaign. Method: Tufts Dining Services provided access to weekly reports generated by composting company Save That Stuff for Carmichael dining Hall from February 2010 through April 2010 as well daily patron counts for both Dewick and Carmichael dining halls. Sums of food composted during our designated pre-trial period and then during our trial period were divided by number of patrons at Carmichael during both time frames.

Question: Is Trayless Worth It?

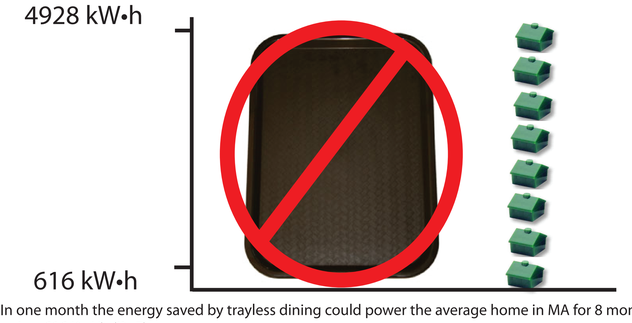


Graph showing how students answered the question: "Is trayless worth it?"

Considerations

- Hot water used in Carmichael's dishwasher is not electrically heated, perhaps reducing energy reductions compared to those at other trayless institutions.
- For such a short study period, more precise means of measuring food waste than estimates from "Save That Stuff" and anecdotal observations were needed
- An extended trial period is needed to show if amount of food purchased over time decreases
- Water meters do not distinguish between the Carmichael dorm and dining hall.
- Students purposefully protesting the campaign may have skewed perception results.

Energy Saved Per Month With Trayless Campaign



In one month the energy saved by trayless dining could power the average home in MA for 8 months. (Avg. home in MA requires 616 KwH). (DoE)

Conclusions

One of the greatest difficulties during the Trayless Campaign lies in the fact that administrative budgeting and academic schedules do not mesh. It is hard for involved students to fully support the program especially since a more meaningful study of trayless dining requires a longer time frame. Building from the strong foundation started by students, dining services staff may now take control of the project and see it to completion.

Acknowledgements

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