



AMERICAN UNIVERSITY

Department of Environmental Science

Dude! Where is My Tray?

Measuring the Impact of Going Trayless
in the Terrace Dining Room

A Report by *ENVS-102 Seminar in Environmental Issues*

Professor Kiho Kim

Department of Environmental Science

April 22, 2009

Authors (in alphabetical order)

C Barnowski, K Barno, V Beard, J Bly, V Cortez, M Devries, K Doucet, Z Drescher,
S Fullerton, S Gannon, D Hill, M Hoak, J Kaplan, J Koester, J Lopresti, S Morawski,
M Nelson-Gal, D Nutt, H Sacks, C Senteney, E Stoddard, K Trout-Haney

Summary

Students in ENVS-102 (SP-09), at the request of Bon Appétit, carried out a study to measure the effects of tray availability on the amount of food wasted and dishes used in the Terrace Dining Room (TDR). On 6 separate days, trays were selectively made available or unavailable at TDR during lunch and dinner. We measured the amount solid food waste and the number dishes used per patron (30 people per sampling episode). The results showed that the removal of trays significantly reduced food waste per person (32%) and significantly reduced dish use per person (27%). Given the approximately 3,200 meals per day served at TDR, the removal of trays could save approximately 27,000 lbs of food waste a semester. This reduction in waste, as well as the reduction in water and energy use for dishwashing (both trays and dishes), could contribute substantially to reducing AU's carbon footprint. Thus, we recommend that Bon Appétit, working with AU students and administration, develop and implement a strategy for going trayless.

Background

According to a recent article in Time¹, cafeteria trays are bad for the environment. Citing a study carried out by ARAMARK Higher Education Food Services², the article suggests that the amount of food wasted by diners is reduced by as much as 25-30% when trays are not used. The removal of trays also means fewer dishes to wash and thus lower water and energy use. However, the report provides little detail on the experimental design, including how the data were collected and analyzed.

In response to a request by Marc Pickering, manager of Marketing with Bon Appétit, the *ENVS-102 Seminar in Environmental Issues* class agreed to carry out an experiment to quantify the impact of “going trayless” in the Terrace Dining Room (TDR). Specifically, the goal of this study was to quantify, using appropriate experimental design, the amount of food wasted and dishes used by TDR diners when trays were either available or unavailable.

Experimental Design

On 6 separate days, February through March, during lunch and dinner, trays were selectively made available or unavailable at TDR using a systematic randomized design (Table 1). Sampling began at 12 noon for lunch and at 6 PM at dinner. Data were collected from the first 30 diners returning their used tray/dishes to the return area. During meals when trays were made available, some diners chose to not use them. In such instances, they were excluded in the sampling for that meal. For each diner, we weighed the solid food waste using an electronic balance (accuracy of 0.1 g) and counted number of dishes (plates and bowls) used. These data were analyzed using ANOVA to test for the effects of tray availability and meal (i.e., lunch vs. dinner) on waste production and dish use³.

Table 1. Sampling dates and tray availability. For each meal, 30 diners were sampled.

Date	Lunch	Dinner
Tues 02/24	no tray	tray
Tues 03/03	tray	no tray
Thur 03/19	tray	no tray
Thurs 03/26	no tray	tray
Thur 04/02	tray	no tray
Tues 04/07	no tray	tray

¹ <http://www.time.com/time/nation/article/0,8599,1834403,00.html>

² The Business and Cultural Acceptance Case for Trayless Dining, ARAMARK Higher Education, July 2008, <http://www.aramarkhighered.com/pdfs/articles/ARAMARK%20Trayless%20Dining%20July%202008%20FINAL.PDF>

³ Data were tested for and met the requirements of normality and homogeneity of variance.

Results

In total, food waste and dishes used during lunch and dinner were measured for 360 TDR diners. As shown in Figure 1, the use of trays contributed to higher waste food production ($F = 6.047$, $p = 0.0362$) and greater dish use ($F = 6.019$, $p = 0.0366$). There was no significant difference between lunch and dinner. When data were averaged across meals, we found that diners using trays produced an additional 35.5 g (1.25 oz) of food wastes and used 0.52 more dishes than diners not using trays. Thus, tray removal in TDR resulted in a 32% reduction in food waste production and a 27% reduction in dish use.

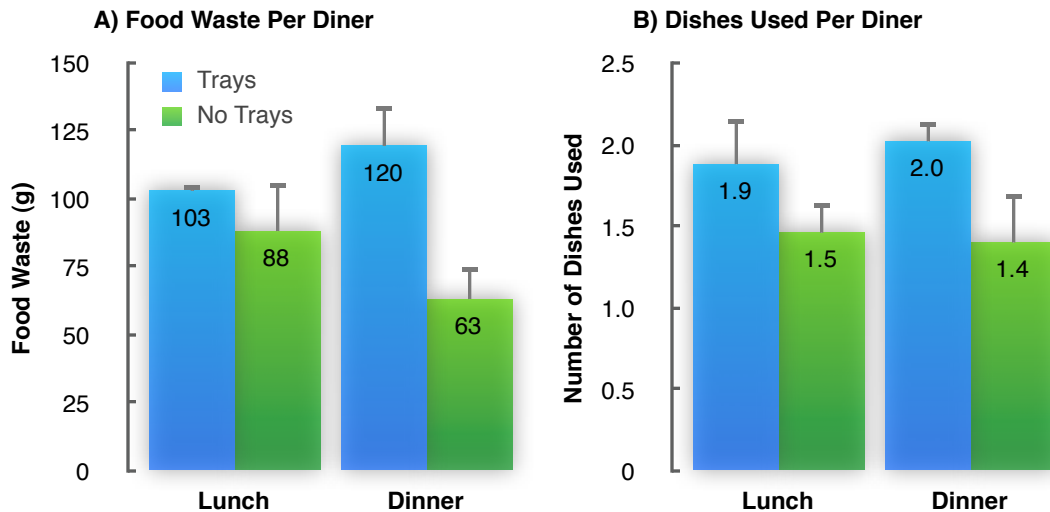


Figure 1. Production of food wastes (g) and the number of dishes used per diner at TDR. Data are given for lunch and dinner and by tray use. Error bars indicate standard errors of the mean. Analysis of Variance indicates that waste production and dish use increased with tray use but was not affected by the meal (i.e., lunch vs. dinner).

Discussion & Recommendations

This study provides a rigorous scientific assessment of the hypothesis that using trays at TDR increases food waste production and dish use. Our results corroborate the ARAMARK report of a 25-30% reduction in food wastes and suggest the potential for substantial reduction in AU's carbon footprint by removing trays. For instance, given that TDR provides approximately 3,200⁴ meals daily, in a single day, food wastes could be reduced by approximately 113 kg (260 lbs), and over a semester, by 12,000 kg (27,000 lbs).⁵ Similarly, the number of dishes that would have to be washed would decrease by more than 174,000, as well as the trays themselves. These simple calculations suggest not only a significant reduction in our carbon footprint but also economic benefits to going trayless⁶.

Based on our findings, we recommend that TDR go trayless. However, we recognize that trays may be needed in some circumstances. Thus, trays should be made available to those who need them. For instance, they could be provided upon request as the diner “swipes in.” As noted in the ARAMARK study, to make going trayless a successful transition, there needs to be a concerted effort to educate and inform the AU community about the benefits of going trayless, not only from Bon Appétit, but from other members of the AU community including various students organizations such as EcoSense, Housing and Dining, and Auxiliary Services.

⁴ Data provided by Marc Pickering.

⁵ Semester was calculated as 7 days x 15 weeks.

⁶ Some of the class's work was featured on Fox New: http://www.myfoxdc.com/dpp/news/local/042209_low_carbon_diet