Sustainability in Foodservice:
Research and Approach to Teaching Students

Kelly J. Whitehair, PhD, RD, LD
Hospitality Management and Dietetics
Kansas State University


• General Facts
• Research
• The Approach
• Discussion

U.S. Foodservice 2013 Projections

- Sales
  - $660.6 billion
- Employment
  - 13 million people

Source: National Restaurant Association, 2012.


Food Waste
• 34.76 million tons in 2010[1,2]
Source: [1]Enviromental Protection Agency, 1999; [2]Environmental Protection Agency, 2011; [3]Jones & MartinezNocito, 2004;[4]Jones, Bockhorst, McGee, & Ndiaye, 2003

Food Waste

- 34.76 million tons in 2010[1,2]

Commercial & Retail

- Dispose of approximately 54 billion pounds of food annually[3]

Source: [1]Enviromental Protection Agency, 1999; [2]Environmental Protection Agency, 2009; [3]Jones & MartinezNocito, 2004;[4]Jones, Bockhorst, McGee, & Ndiaye, 2003

Food Waste

- 34.76 million tons in 2010[1,2]

Commercial & Retail

- Dispose of approximately 54 billion pounds of food annually[3]

Consumers

- Dispose of approximately 14% of the meats, grains, fruits and vegetables[4]

Source: [1]Enviromental Protection Agency, 1999; [2]Environmental Protection Agency, 2009; [3]Jones & MartinezNocito, 2004;[4]Jones, Bockhorst, McGee, & Ndiaye, 2003

RESEARCH

Investigation of Strategies to Decrease Food Waste in College and University Foodservice

Food Waste

- University Foodservice
  - 540,000 tons of food waste per year[1]
  - More than 83.5 tons of edible tray waste[2]
  - Two to three ounces per tray[3,4,5]

Source: [1]Saphire, 1995, [2]Shanklin & Ferris, 1992; [3]Aramark, 2008; [4]Nortin & Martin, 1991; [5]Van Handel, 2004

Food Waste

- Methods of Waste Management[6]
  - Landfills
  - Garbage disposals
  - Composting and animal feed

Source: [1]Ferris, Flores, Shanklin, & Whitworth, 1995

Messaging

- Elaboration Likelihood Model of Persuasion[1]
- Messaging & Sustainable Behaviors[2,3]
- Feedback-based Messages[4,5,6,7]

Sources: [1]Petty, Cacioppo, Strathman, & Priester, 1994; [2]Burn & Oskamp, 1986; [3]Kok & Siero, 1985; [4]Abrahamse, Steg, Vlek, Rothengatter, 2007; [5]Petersen, Shunturov, Janda, Platt, & Weinberger, 2007; [6]Arbuthnott, 2009; [7]Darby, 2001

Purpose

- Determine how to introduce a food waste behavior change into a university dining center community in a way that:
  - Used a simple message-type intervention
  - Required little sustained administrative effort
  - Provided optimum impact immediately and in the long term

Setting and Participants

- Van Zile Dining Center
- Population: 540 students
- Sample: Students who ate meals in-house at Van Zile Dining Center during the data collection period

Component One: Research Design

- **Phase 1:** Gather Baseline Food Waste Data

Research Design

- **Phase 1:** Gather Baseline Food Waste Data

- **Phase 2:** Prompt-Type Message Intervention
  Gather Food Waste Data

Eat What You Take

Don't Waste Food

Research Design

- **Phase 1:** Gather Baseline Food Waste Data

- **Phase 2:** Prompt-Type Message Intervention
  Gather Food Waste Data

- **Phase 3:** Feedback-Based Message Intervention
  Gather Food Waste Data

On average, each Strong Complex Resident wastes

2.15 oz. of food each meal.

This amounts to more than

32 pounds per person per semester.

(based on 15 meal plan)

Strong Complex disposes of

more than 45 pounds of edible food

each meal on trays.

That is enough food to prepare

more than 30 meals.

Major Findings

- Edible Food Waste
  - 7,574 individual trays were coded and documented
  - 11,472 trays were collected as an aggregate measure

Major Findings

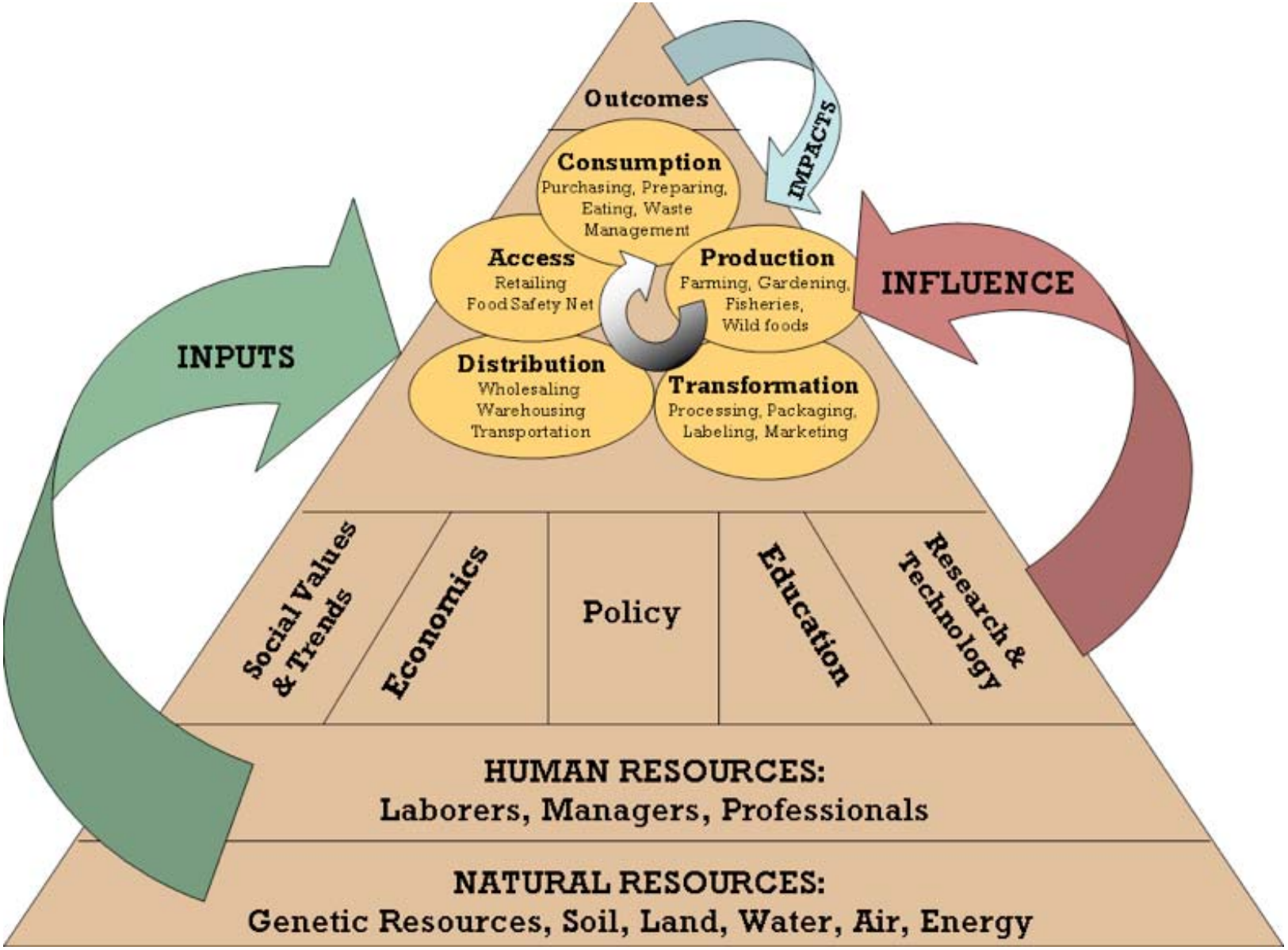
- Edible Food Waste
  - Waste ranged from 0 to 998 grams per tray
  - Average waste per tray was 57 grams (~2 ounces)
  - More than 1.5 tons of edible waste during the six-week period of lunch and dinner meals Monday through Friday

Major Findings

	Mean Edible Food Waste Per Tray (N=296)		
	Mean ± Standard Deviation (grams)	***F***	**Sig.**
Time 1 (Baseline)	62.76±56.10*	3.888	0.024
Time 2 (Prompt)	53.08±67.08*		
Time 3 (Feedback)	54.23±56.75		

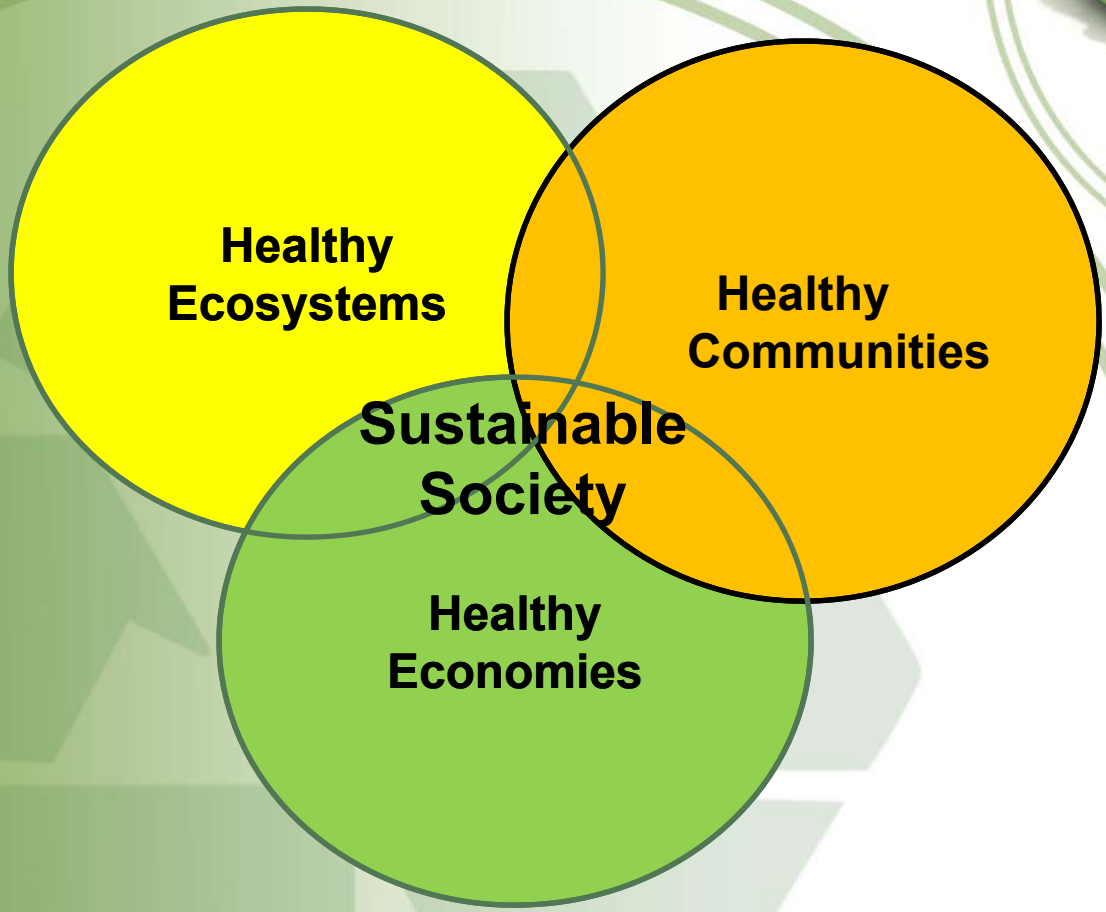
***Means differ significantly when using an ANOVA with a Greenhouse-Geisser correction, ($p \leq 0.05$).**

“Get the word out.”



Source: American Dietetic Association Sustainable Food System Task Force. *Healthy Land, Healthy People: Building a Better Understanding of Sustainable Food Systems for Food and Nutrition Professionals. A Primer on Sustainable Food Systems and Emerging Roles for Food and Nutrition Professionals*. Chicago, IL: American Dietetic Association; 2007.

The Triple Bottom Line



Debra Rowe, 2009

Where do we go from here?

- Industry
- Operations
- Managers
- Educators

As Educators…

- We can change some of the norms so our students become:
  - Environmental Responsible
  - Socially Responsible
  - Economically Responsible
  - Active Citizens in the Global Economy

“We must be the change we want to see in the world”

Gandhi

References

- Abrahamse, W., Steg, L., Vlek, C., & Rothengatter, T. (2007). The effect of tailored information, goal setting, and tailored feedback on household energy use, energy-related behaviors, and behavioral antecedents. *Journal of Environmental Psychology, 27*, 265-276.
- American Dietetic Association Sustainable Food System Task Force. (2007). *Healthy Land, Healthy People: Building a Better Understanding of Sustainable Food Systems for Food and Nutrition Professionals. A Primer on Sustainable Food Systems and Emerging Roles for Food and Nutrition Professionals*. Chicago, IL: American Dietetic Association.
- Aramark. (2008, July). The business and cultural acceptance case for trayless dining. *Aramark Higher Education*, 2-7.
- Arbuthnott, K. D. (2009). Education for sustainable development beyond attitude change. *International Journal of Sustainability in Higher Education, 10*, 152-163.
- Burn, S. M., & Oskamp, S. (1986). Increasing community recycling with persuasive communication and public commitment. *Journal of Applied Psychology*, *16*(1), 29-41.
- Darby, S. (2001, January 30). Making it obvious: Designing feedback into energy consumption. *Energy Efficiency in Household Appliances and Lighting*. Retrieved from http://www.electrisave.co.uk/cms/thesite/public/uploads/uploadsbank/1112705999 _390.pdf
- Environmental Protection Agency. (1999). *Characterization of municipal solid waste in the United States: 1998 update.* EPA Report #530-R-00-034. Retrieved from http://www.epa.gov/epawaste/nonhaz/municipal/pubs/98charac.pdf
- Environmental Protection Agency. (2011). Municipal solid waste generation, recycling, and disposal in the United States: Facts and figures for 2010. Retrieved from http://www.epa.gov/wastes/nonhaz/municipal/pubs/msw_2010_rev_factsheet.pdf
- Ferris, D. A., Flores, R. A., Shanklin, C.W., & Whitworth, M. K. (1995). Proximate analysis of food service waste. *Applied Engineering in Agriculture, 11*, 567-572.
- Jones, T. (n.d.). *Using contemporary archaeology and applied anthropology to understand food loss in the American food system*. Bureau of Applied Research in Anthropology, University of Arizona. Retrieved from http://www.ce.cmu.edu/~gdrg/readings/2006 /12/19/Jones_UsingContemporaryArchaeologyAndAppliedAnthropologyToUnderstand FoodLossInAmericanFoodSystem.pdf
- Kok, G., & Siero, S. (1985). Tin recycling: awareness, comprehension, attitude, intention, and behavior. *Journal of Economic Psychology, 6*(2), 157-173.
- Norton, V. P., & Martin, C. (1991). Plate waste of selected food items in a university dining hall. *School Food Service Research Review, 15*(1), 37-39.
- NRA (2012). 2013 Restaurant Industry Forecast. Retrieved from http://www.restaurant.org/News-Research/Research
- Petersen, J. E., Shunturov, V., Janda, K., Platt, G., & Weinberger, K. (2007). Dormitory residents reduce electricity consumption when exposed to real-time visual feedback and incentives. *International Journal of Sustainability in Higher Education, 8*(1), 16-33.
- Rowe, Debra. (2009). Kansas: creating national models for statewide sustainability networks. Proceedings from K-State Sustainability Conference.
- Saphire, D. (1995). Making less garbage on campus: A hands-on guide. *INFORM*, *4*(2).
- Shanklin, C. W., & Ferris, D. F. (1992). *Waste stream analysis of Derby and Van Zile Dining Centers at Kansas State University*. (Unpublished data). Management report submitted to Kansas State University Housing and Dining Services.
- Van Handel, B. (2004). Quantifying food residuals in campus cafeteria. *BioCycle, 45*(3), 4-44. Petty, R. E., Cacioppo, J. T., Strathman, A., & Priester, J. R. (1994). To think or not to think: Exploring two routes to persuasion. In S. Shavitt & T. C. Brock (Eds.), *Persuasion: Psychological insights and perspectives*. New York, NY: Allyn & Bacon.