Ohio State Food Waste Collaborative

Leveraging the University as a Living, Learning Laboratory

Brian E. Roe, Van Buren Professor

Session: Combating Food Waste on College Campuses

Des Moines
September 12, 2018
Genesis & Mission

Genesis

• A group of faculty, students, staff and community partners with common interests in addressing food waste joined to develop and submit a seed grant to the Initiative for Food and Agricultural Transformation (InFACT) & the President’s & Provost’s Council on Sustainability Fund with matching funds from the my home department.

• The core group has been meeting since Dec. 2015

Mission

To promote the reduction & redirection of food waste as an integral part of a healthy & sustainable food system.
Leadership Team

• OSU Faculty
  • Roe (Lead - AEDE), Emily Buck & Annie Specht (ACEL)
• Administrative Staff
  • Tony Gillund (OSU Facilities), Aparna Dial (Wexner Medical Cen.)
• OSU Students
  • Danyi Qi (AEDE), Angel Arroyo-Rodriguez (CRP)
• External
  • Angel Arroyo-Rodriguez (Ohio EPA)
  • Mike Long (Resources 100)
  • Corby Martin & John Apolzan (Pennington Biomedical/LSU)
• Staffing
  • Julie Manning (Admin), Katie LeBlanc (food flows project lead),
    Julia Hilty (Law project lead), Andrew Jones (black soldier fly lead)
Activities

Research
- Consumer Behavior, Economic Analyses, Supply Chain
- Articles, Presentations, Grants, App Development

Outreach, Education & Network Facilitation
- Annual Conference and Webinar
- Date Labeling Project
- Newsletter and Informational Presentations
- Media Engagement

Project Consultations & Evaluations
- Campus
- Community, State & National
Research

- Peer-reviewed Articles and related Studies
  - E.g., Consumer Discard Intentions with Different Date Label Phrases (with Heldman, Simons, Bender and Badiger)

- Dissertation Essays
  - E.g., Predictors of household participation in municipal programs for recycling household food waste through curbside collection (Arroyo-Rodriguez)

- Academic Presentations
  - E.g., “The Role of Incidental Learning on Reducing Household Food Waste in Free-Living Conditions” (with Qi, Martin and Apolzan)

- FoodImage Smart Phone App (with Martin & Apolzan – USDA funding)

- Internal and External Grants
  - E.g., “Impact Measurement for the National Virtual Resource Center for Food Loss and Waste” USDA – Chief Economists Office
Outreach

• Annual Conference and Webinar
  • Cultivate regional conversations & networking opportunities among diverse FW audiences
    • Hunger advocates, consumer groups, waste & compost handlers, businesses & entrepreneurs, municipalities & schools, food service entities, environmental groups
  • Update regional audience on national issues/trends
    • Speakers from USDA, US EPA, Harvard, Johns Hopkins, NRDC, U. Minnesota, + state/local speakers
• 3rd conference on Oct. 11
• National speakers/panels archived online
Outreach

• Ohio Food Date Labeling and Donation
  • Review of Ohio Revised Code with suggested paths forward
• Numerous informational presentations to interested student, community & industry groups
  • High schools, college classes, MORPC, Nestle, etc.
• Media support of conferences and articles
  • Bloomberg, USA Today, Newsweek, Huffington Post, NPR (the Salt)
Campus Projects

Residence Hall Composting Pilot – Spring ‘17

• Student led & organized (learning community)
  • Yielded student research presentations
• Buy in critical
  • Student life + Housekeeping + Facilities
• OSFWC paid for student hours & materials
• Facilities provided vehicle
  • (transport to campus farm)
• Pilot yielded 392 lbs. total FW + compostables
• If results replicated in all residence halls:
  • Could yield ~ 13 tons/AY
  • Or about 4% of current FW diversion total
Campus Projects & Consults

Student Business Start Up Support

- OSU student duo
- Sought FWC advice for developing a business concept
  - Online platform for matching residents seeking curbside FW pick up and FW recyclers
- FWC members provided general advice, facilitated networking
- Hired students to develop background research related to the food recycling sector and related business opportunities
- Students have developed a platform prototype
- Created a pitch for a local venture capital and startup incubator
Food Flows Project

• Documenting
  • Current entry points and disposition channels (consumed vs. landfill vs. compost vs. other) for food and related organic materials on campus
  • Current projects and technologies involving redirection of food waste and related materials from landfill

• Requires bringing key parties together to develop a strategic plan for
  • Reducing campus food waste and
  • Diverting remaining food waste from landfills
Campus Projects: Food Flows

Goals:

- Stimulate new thinking about how to limit waste and divert food and other organic waste from landfills to support OSU’s official Sustainability Goals
- Document success stories already in place that may not be receiving due credit
- Permit campus-wide sharing of ideas for, advancements in, and frustrations with reduction and diversion approaches
- Provide a platform that facilitates campus-wide planning for diversion technology or related initiatives
Major OSU Food Entities

- Working for buy-in with each entity for data and measurement
Dining Services: Inventory of Facilities

All you care to eat & related facilities

Marketplace concepts & related facilities

Café concepts & related facilities

Production Facilities

- Scott
- Morrill
- Kennedy
- MOCO Fusion
- 12th Avenue Bread Company
- Curl Market
- Union Market
- Sloop's
- Woody's
- Express-Oh
- Marketplace on Neil
- Terra Byte
- Berry
- Campus Grind 1
- Campus Grind 2
- CFAES
- ksa
- Food Truck
- Cranes
- Culinary Element
- Instructional Kitchen
- Production Kitchen
Flowcharts of each facility

• Detailed
• General
Large storage spaces
- Many walk-in coolers and freezers
- Orders are placed by studying pars and keeping inventory
- Most notable waste at this step is from special order items, tend to order high. (Volume of waste is not much)

Prep and cooking
- Very little inedible waste at this step because almost all produce comes pre-prepped
- When opened, no pre-sliced ingredients, had to change because of under-staffing

Waste from stations (i.e. over-fired), to biodigester. Sometimes to trash due to time constraints

Biodigesters (upstairs and downstairs)
- Waste turns to greywater, goes to wastewater treatment center
- Difficult to feed large quantities
- Sometimes breaks down

Back loading dock

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Some leftovers re-used, i.e. rice turned into fried rice

Dining Room upstairs

Dining Room downstairs

Traditions at Scott

Home Station

Latin Station

Solutions

Mongolian Station

Serving area

Evo

Cereal

Desserts

Salad

Waste from stations (i.e. over-fired), to biodigester. Sometimes to trash due to time constraints

Biodigesters (upstairs and downstairs)
- Waste turns to greywater, goes to wastewater treatment center
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Any waste dropped down during serving to trash

Dishrooms (upstairs and downstairs)
- Plates are placed on conveyor belt and scraped into trough by staff
- Broccoli, grilled cheese, tomato sauce

Measuring waste 2/5-2/26

Solutions

Dining Room upstairs

Dining Room downstairs

All post-consumer waste goes to dishrooms

Question: is this correct that waste goes to trash and not BioDigester?

Biodigesters (upstairs and downstairs)
- Waste turns to greywater, goes to wastewater treatment center
- Difficult to feed large quantities
- Sometimes breaks down

Some leftovers re-used, i.e. rice turned into fried rice

Dining Room upstairs

Dining Room downstairs

Traditions at Scott
Traditions at Scott - Overview of flows

Vendors → Orders ($) → Loading dock → Storage → Kitchen, prep → Serving (stations, some self-serve) → Dining in (x% to go) → Sales($) → Post-consumer waste → Biodigester

Some waste can be returned to vendor

X lbs donated

X% to trash, x% to biodigester

Legend

Highlighted means data is collected/available on this flow

Food Bank

Biodigester

X lbs to trash?
First Steps in Estimating Food Flows

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**QUESTIONS FOR FACILITY MANAGERS**

1. What is an appropriate assumption for calories or pounds of food selected per meal for each of your locations?
2. If pounds of food selected isn’t available, is 1000 calories per pound the best ‘guess’ for translating calories to pounds for your meals?
3. For your locations without measured plate waste, what is a good plate waste estimate?
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QUESTIONS FOR FACILITY MANAGERS
1. What is an appropriate assumption for % or pounds of pre-consumer food waste per patron for each of your locations?
2. Is there data to check the calculation on pounds of food shipped to each location per patron?
Example: Morrill per patron food pounds if (guess) 15% pre-consumer waste and (guess) 600 calories consumed per patron

<table>
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<th>Percent</th>
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<tr>
<td>Kitchen</td>
<td>0.600</td>
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<tr>
<td>After Kitchen</td>
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Example: Morrill per patron food pounds if (guess) 15% pre-consumer waste and (guess) 600 calories consumed per patron.
Example: Morrill food pounds if (guess) there were 200,000 patrons per year

Entering Kitchen: 141,176 lbs/yr

Served/Selected: 120,000

Unserved (trim, etc): 21,176

Consumed: 103,800 lbs

Diverted: 0

Landfill: 37,376 lbs

Donated: 0

Totals: Consumed 103,800 lbs, Landfilled 37,376 lbs, Diverted 0, Donated 0
Example:
Morrill food destination Percentages

**Back Dock**
- Entering Kitchen: 100%

**Kitchen**
- Served/Selected: 85%
- Unserved (trim, etc): 15%

**After Kitchen**
- Consumed: 74% (86%)
- Diverted: 0.0
- Landfill: 11% (14%)
- Landfill: 15% (100%)
- Diverted: 0.0
- Donated: 0.0

**Percent**
- Consumed: 74%
- Landfilled: 26%
- Diverted: 0%
- Donated: 0%
**Big Goal**

- Repeat for every location
- Integrate numbers into the flow charts
- Overlay key statistics onto a campus map for planning purposes
- Build an abstract ‘grand flow chart’ as if all food on OSU campus flowed through a single facility

**The data infrastructure can help**
- Determine appropriate sizing of any future diversion systems
- Arrangement of routes if diversion would require collection
- Prioritization of internal efforts
  - Where you’d like to do data collection
  - Finding the ‘low hanging fruit’ to improve sustainability
- Tracking of past and future progress toward sustainability goals
- Help build a structure for future work on compostable materials and other related organics and recycling efforts
Black Soldier Fly Composting Facility
Black Soldier Fly Composting Facility

- OK, facility is a bit of a stretch
  - We have a 45’ shipping container
  - Had to convince the University’s architect

- Research objective: understand ability of such a system to
  - Handle post-consumer food waste with varying levels and types of contamination
  - Add economic value as
    - A stand-alone system or as
    - A system to complement other composting technologies

- Offers opportunity to ‘close the loop’ if complemented with appropriate fish, poultry or swine operation
Questions?

Webpage: https://u.osu.edu/foodwaste/
Email: roe.30@osu.edu
Thanks: Katie LeBlanc, Meredith Krueger, Andrew Jones, Sarah Grossman and the SUSTAINS team