

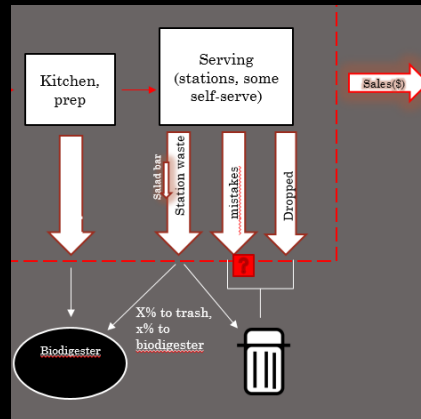
# Ohio State Food Waste Collaborative

## 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 (ACEEL)
- 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
- 3<sup>rd</sup> 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

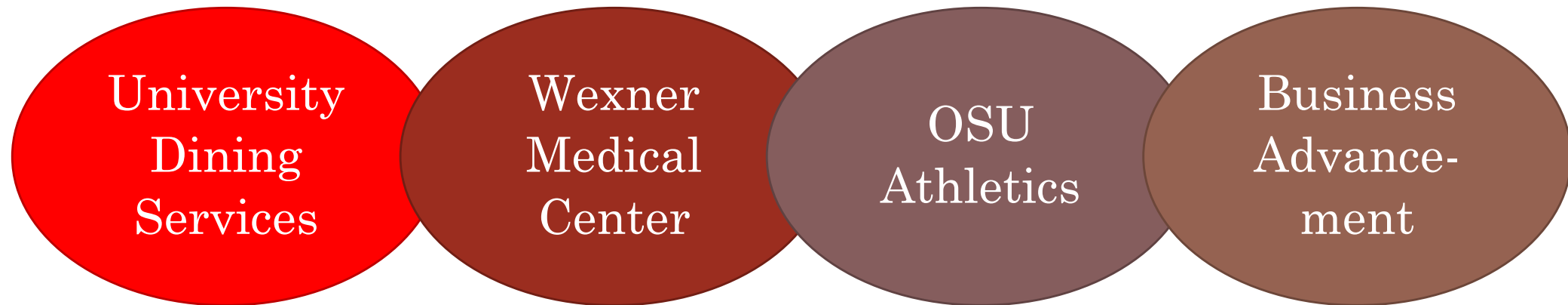
# Campus Projects: Food Flows

## 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

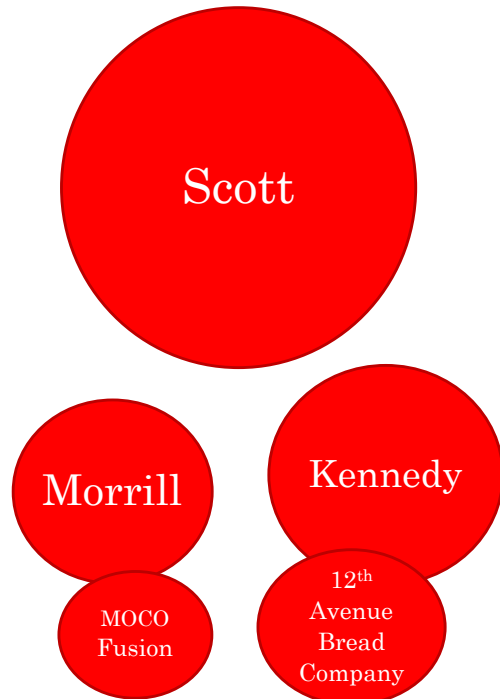
# Major OSU Food Entities

- Working for buy-in with each entity for data and measurement



# Dining Services: Inventory of Facilities

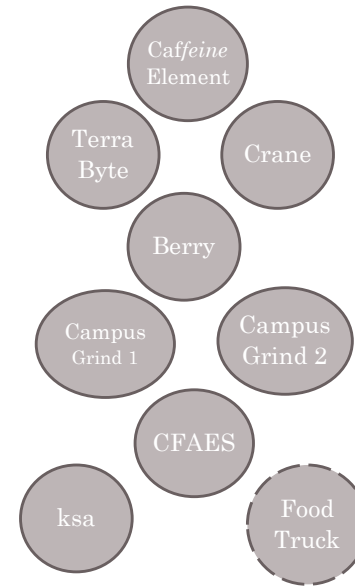
All you care to eat  
& related facilities



Marketplace concepts  
& related facilities



Café concepts  
& related facilities



Production  
Facilities



# Flowcharts of each facility

- Detailed
- General



# Traditions at Scott

**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

Latin Station  
Mongolian Station

Home Station  
Solutions

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

Evo

Salad

Desserts

Cereals

**Biodigesters**  
(upstairs and downstairs)

- Waste turns to greywater, goes to wastewater treatment center
- Difficult to feed large quantities
- Sometimes breaks down

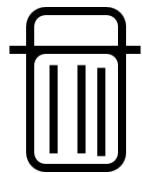
Some leftovers re-used, i.e. rice turned into fried rice

**Dishrooms**  
(upstairs and downstairs)

- Plates are placed on conveyor belt and scraped into trough by staff
- Broccoli, grilled cheese, tomato sauce

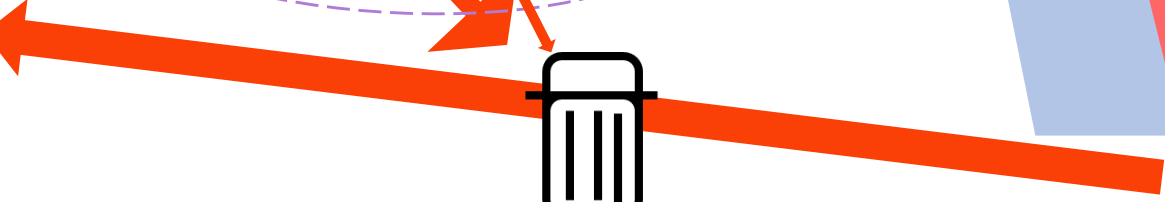
All post-consumer waste goes to dishrooms

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



**Vendors**  
US Foods (main), Northern Hazarat, Blue Ribbon Meats, Sea to Table, GHO (organic produce), Premier Produce ONE

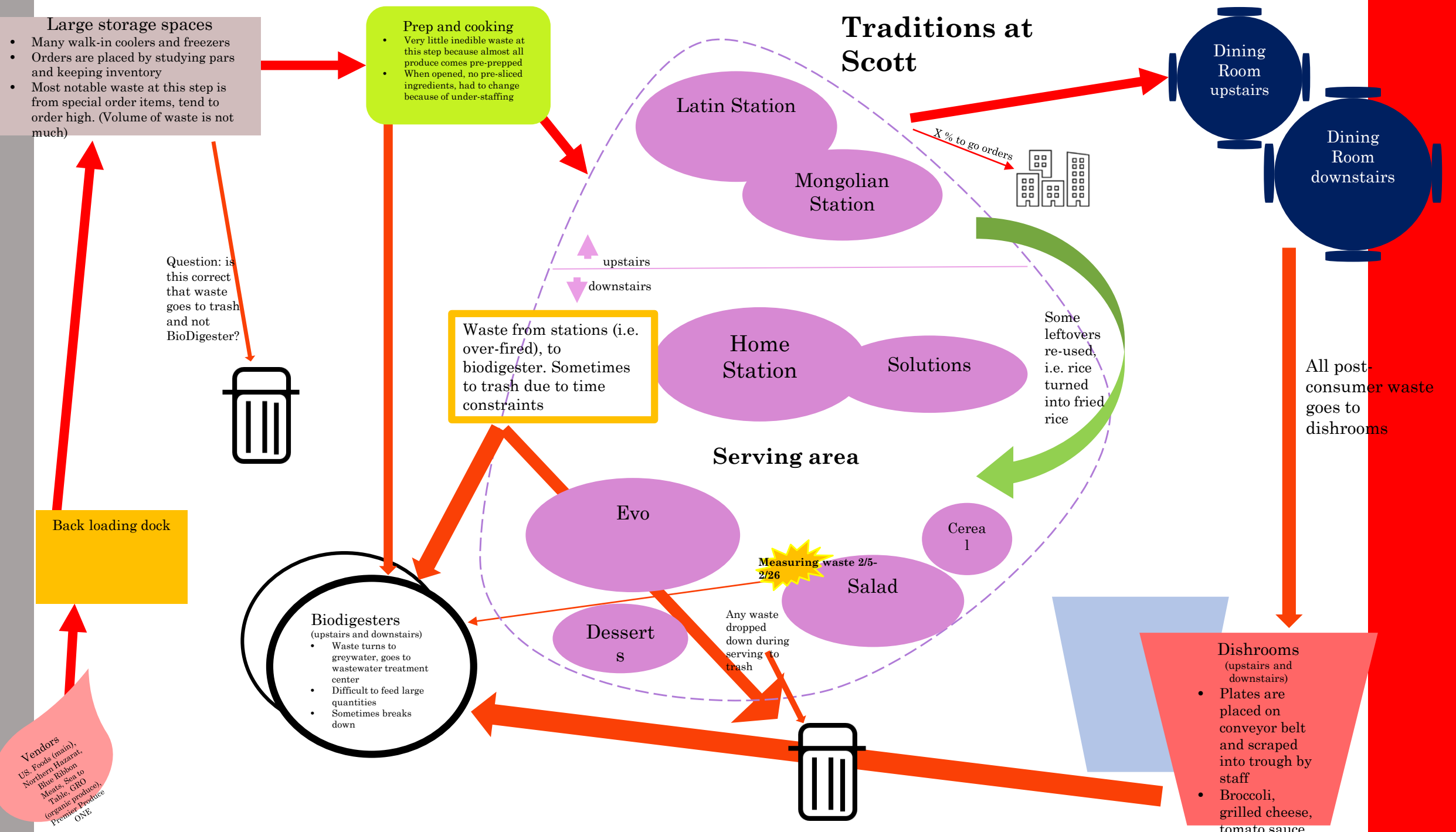
Back loading dock



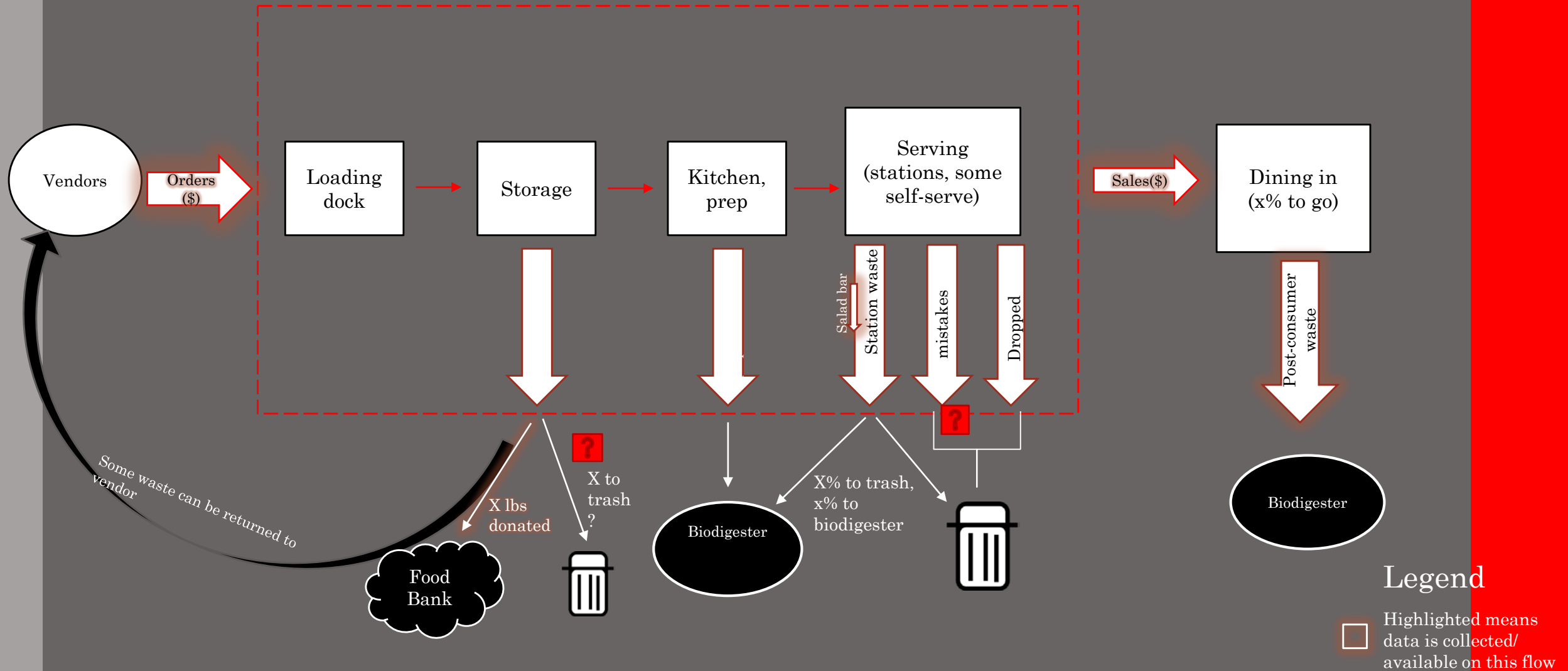
upstairs  
downstairs

Measuring waste 2/5-2/26

Any waste dropped down during serving to trash



# Traditions at Scott - Overview of flows



# First Steps in Estimating Food Flows

Average	Morrill	Kennedy	Scott
Plate Waste (lbs/patron) (Measured in 2017/18)	0.081	0.096	0.176



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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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% Pre-consumer waste (trim, unserved, etc.) (Brian's Wild Guess)	15%	15%	15%

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Pounds of food shipped to location per patron (Calculated)	0.60/0.85 =0.706	0.60/0.85 =0.706	0.65/0.85 =0.765

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Pounds of pre-consumer waste per patron (Calculated)	0.15*0.706 =0.106	0.15*0.706 =0.106	0.15*0.765 =0.115

# Next Steps in Estimating Food Flows

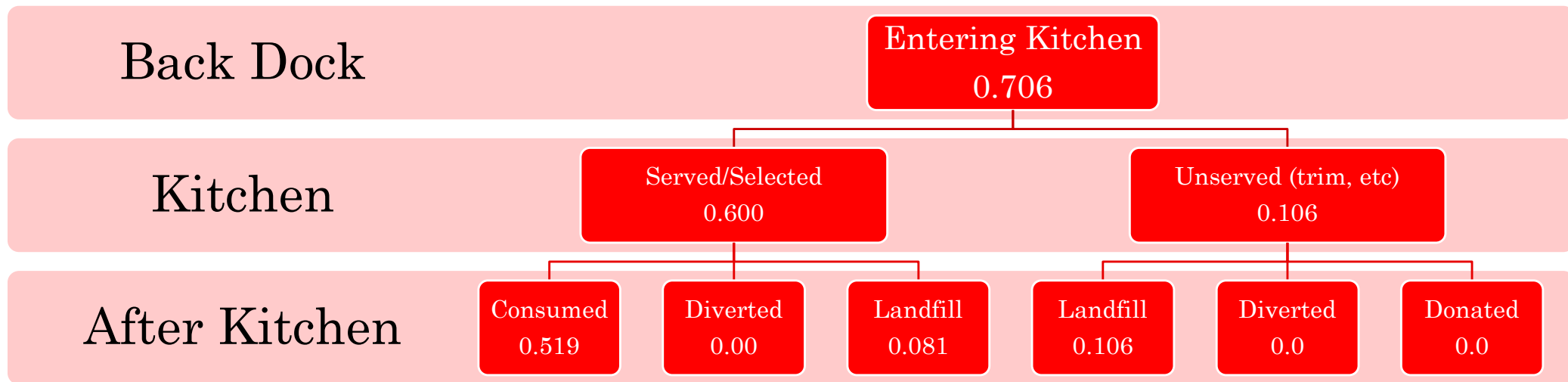
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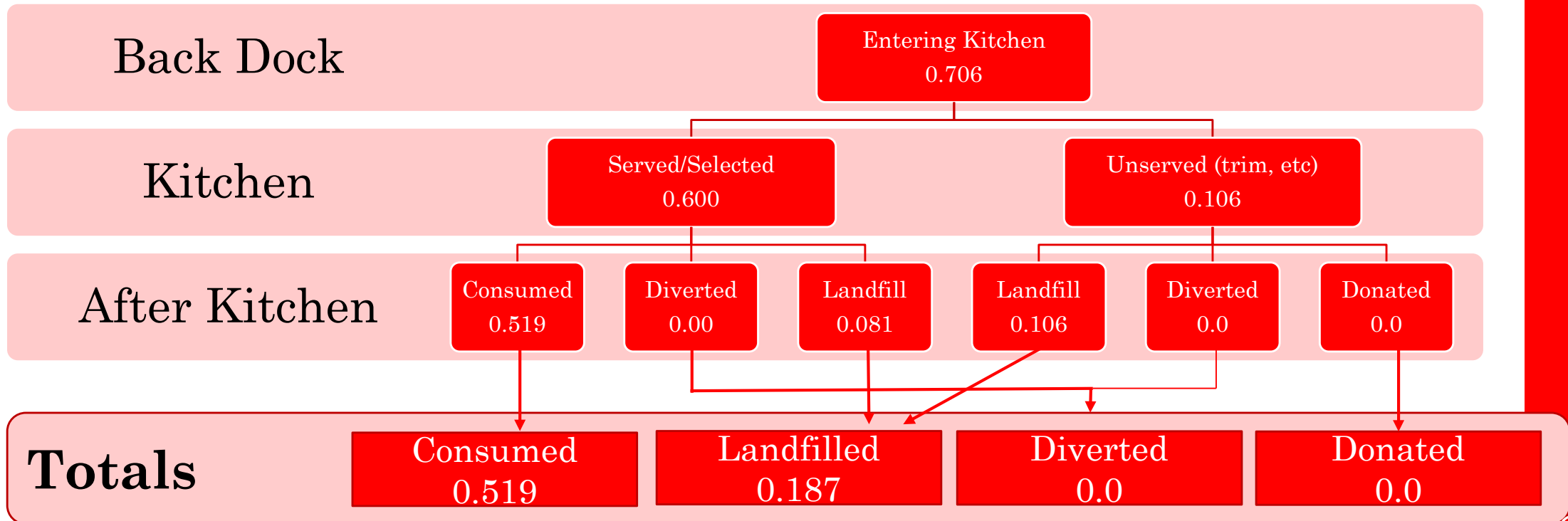
1. What is an appropriate assumption for % or pounds of pre-consumer food waste per patron for each of your locations?
2. Is there data to check the calculation on pounds of food shipped to each location per patron?



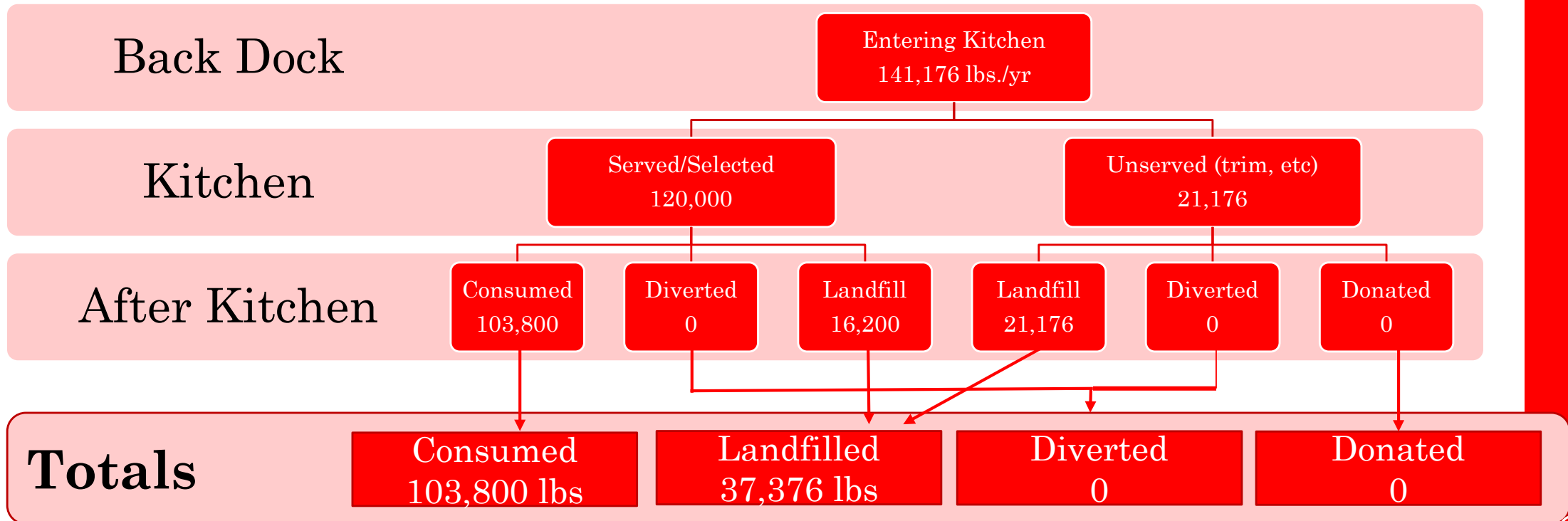
# Example: Morrill per patron food pounds if (*guess*) 15% pre-consumer waste and (*guess*) 600 calories consumed per patron



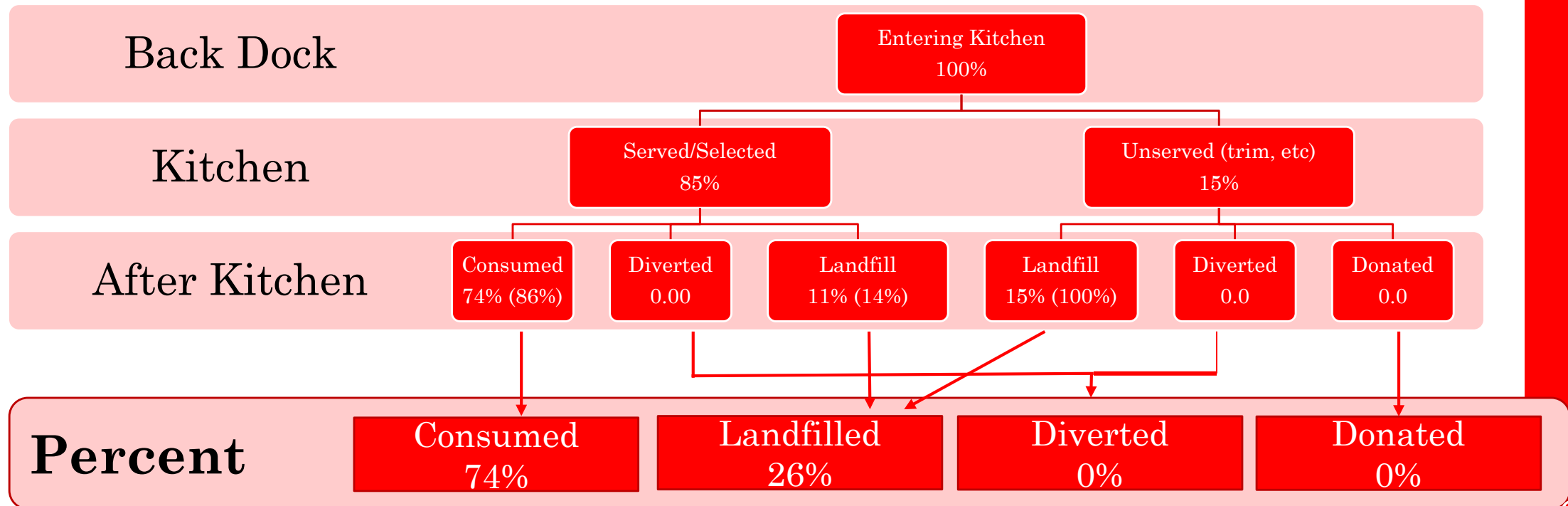
# Example: Morrill per patron food pounds if (*guess*) 15% pre-consumer waste and (*guess*) 600 calories consumed per patron



# Example: Morrill food pounds if (*guess*) there were 200,000 patrons per year



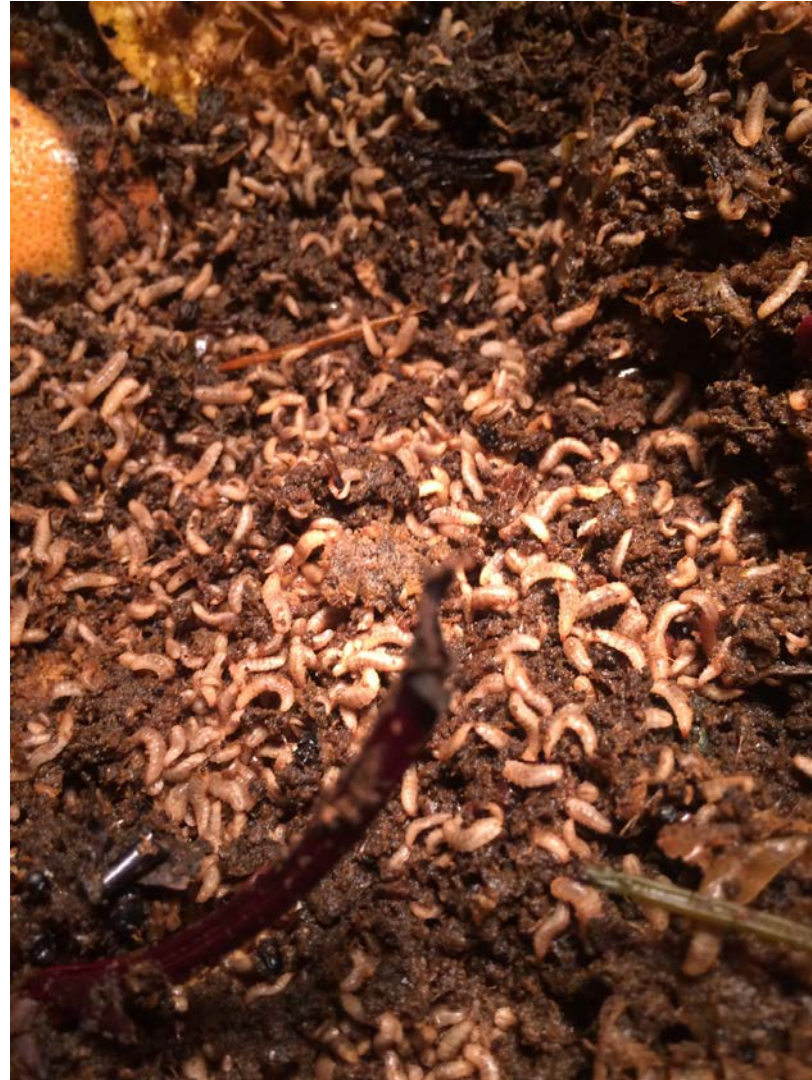
# Example: Morrill food destination Percentages



# 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](mailto:roe.30@osu.edu)

Thanks: Katie LeBlanc, Meredith Krueger, Andrew Jones,  
Sarah Grossman and the SUSTAINS team



THE OHIO STATE UNIVERSITY

President & Provost's  
Council on Sustainability

