Agenda

• Project motivations
• Replication model overview
• Food processing plants
• Restaurants
• Challenges for future implementation
• Personal benefits of project
“Organic” Waste

Organic Waste: Food Waste and Compost

Food Waste: Overproduction, surplus inventory, spoiled/Expired foods

Compost: Non-recyclable paper, food-grade paper
Goal of Resource Recovery Project Board

• By 2030, organics recovery will account for 15% of garbage collected within the Twin Cities Metropolitan Area
  – Develop and expand source separated organic material (SSOM) programs to divert material
  – Gather preliminary data
  – Develop replication model to collect SSOM from high and medium volume generators
Motivations for Change

• True cost of solid waste for businesses
  – Raw material
  – Labor invested
  – Disposal

• County Environmental Charge (CEC)
# CEC: Trash Collection Only

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount</th>
<th>Subject to CEC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Trash Service</td>
<td>$300</td>
<td>✔</td>
</tr>
<tr>
<td>Fuel Surcharge</td>
<td>$100</td>
<td>✔</td>
</tr>
</tbody>
</table>
| CEC                                       | $212 (53% for Ramsey)
$150 (37.5% for Washington)             |                |
| MN State Solid Waste Management Tax       | $68 (17%)                                   |                |
| **Total**                                 | **$680 for Ramsey
$618 for Washington**                       |                |
## CEC: Trash, Recycling, Organics Collection

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount</th>
<th>Subject to CEC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Trash Service</td>
<td>$150</td>
<td>✔</td>
</tr>
<tr>
<td>Recycling Service</td>
<td>$100</td>
<td></td>
</tr>
<tr>
<td>Organics Service</td>
<td>$50</td>
<td></td>
</tr>
<tr>
<td>Fuel Surcharge</td>
<td>$100</td>
<td>✔</td>
</tr>
<tr>
<td>CEC</td>
<td>$133 (53% for Ramsey)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$93 (37.5% for Washington)</td>
<td></td>
</tr>
<tr>
<td>MN State Solid Waste Management Tax</td>
<td>$68 (17%)</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$601 for Ramsey</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>$561 for Washington</strong></td>
<td></td>
</tr>
</tbody>
</table>
Replication Model Overview

1. Evaluate waste stream
2. Research end market options
3. Choose who to involve
4. Implement organics management program
Evaluate Waste Stream

• Gather data regarding:
  – Current waste disposal methods
  – Amount of waste
  – Composition of waste
    • Food, compostable, recyclable, trash
Research End Market Options

Food Recovery Hierarchy

- Source Reduction
- Feed Hungry People
- Feed Animals
- Industrial Uses
- Composting
- Incineration or Landfill

Most Preferred
Least Preferred
Choose Who to Involve

- Management
- Staff
- Current solid waste haulers
- Potential organic waste haulers
Implement

- Reduce food waste
- Coordinate with waste haulers
- Develop organics separation procedures
- Train and educate staff
- Continual measurement and evaluation
Supplemental Information

- End market disposal options
- Waste container options
- Food waste conversions
Land O’Lakes
Matt Domski
MnTAP Advisor: Sarah Haas
Food Processing Industry

- **Full-scale facilities**
  - Product for distribution/sale
    - Efficient production

- **R&D facilities**
  - Pilot/trial production
    - Product reformulation
    - Scale-up readiness
    - Consumer testing
Replication Model Overview

1. Evaluate waste stream
2. Research end market options
3. Choose who to involve
4. Implement organics management program
Land O’Lakes - Dairy Foods R&D
Food research, testing, and pilot facility
### Organic Waste - Land O’Lakes R&D

<table>
<thead>
<tr>
<th>Facility Location</th>
<th>Waste Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pilot Plant</td>
<td>Processed cheese excess, shredded cheese, fats/oils</td>
</tr>
<tr>
<td>Food Service Lab</td>
<td>Cheese sauce, mac n’ cheese, shredded cheese</td>
</tr>
<tr>
<td>Ingredients Lab</td>
<td>Spray dried cheese powders, powdered seasonings</td>
</tr>
<tr>
<td>Retail Lab</td>
<td>Butters/spreads, yogurt, cheese, miscellaneous food</td>
</tr>
<tr>
<td>Cold and Frozen Storage</td>
<td>Dairy inventory from all labs and the pilot plant</td>
</tr>
</tbody>
</table>
Waste Evaluation: Land O’Lakes R&D

R&D Food Waste Collection

<table>
<thead>
<tr>
<th>Week</th>
<th>Weight in lbs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 1</td>
<td>1300</td>
</tr>
<tr>
<td>Week 2</td>
<td>200</td>
</tr>
<tr>
<td>Week 3</td>
<td>100</td>
</tr>
<tr>
<td>Week 4</td>
<td>1700</td>
</tr>
<tr>
<td>Week 5</td>
<td>2200</td>
</tr>
<tr>
<td>Average</td>
<td>1100</td>
</tr>
</tbody>
</table>

Weight in lbs.
Waste Evaluation: Land O’Lakes R&D

• Inconsistent waste quantity
• Food waste
  – 90-95% dairy
  – Tested product
• Food packaging
  – 60% unpackaged
  – 40% packaged
End Market Recommendations: Land O’Lakes R&D

Food-to-livestock options:

1. Feed processing
2. Directly to livestock farms
End Market Recommendations: Land O’Lakes R&D

- Decision: Directly to livestock
  - Charges per bin collected, ~ $4/barrel
  - Collects full bins only
  - Accounts for 60% of food waste
## Recommendations

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Hierarchy Level</th>
<th>Benefits/Savings</th>
<th>Status</th>
</tr>
</thead>
</table>
| Barthold Farms, packaging-free food collection 3 days/week | Feed Animals | • Reused ~1.5 tons of organic material per month (60% of food waste)  
• Reduced weight/volume of trash | Implemented |
| Reduce trash pickup from 5 to 3 days/week | N/A | • Over $900/month | Implemented |
## Recommendations Summary: Recommended

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Hierarchy Level</th>
<th>Benefit or Savings</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Add container from Endres Processing for packaged food waste</td>
<td>Feed Animals</td>
<td>• 1 ton of organic waste reused (the other 40% of food waste)</td>
<td>Recommended</td>
</tr>
<tr>
<td>Reduce trash pickup from 3 to 2 days/week</td>
<td>N/A</td>
<td>• About $600/month</td>
<td>Recommended</td>
</tr>
</tbody>
</table>
Who to Involve:
Land O’Lakes R&D

- Technical Assistance – **Sarah Haas**
- Plant Manager - **Carle Shanks**
- Sustainability - **Becky Kenow**
- Building & Office Services
- Current Waste Haulers
- Lab and pilot plant employees
  - Don Ackman and James Deputie help separate food waste (right).
Keys to Implementation: Land O’Lakes

- Find correct vendor
- Educate staff
- Pilot program
- Assess feasibility of reducing trash service
- Monitor organic service
- Consider additional future options
Restaurants
Jessica Primozich
MnTAP Advisor: Sarah Haas
Restaurants

• White Bear Lake
  – Donatelli’s
  – Rudy’s Redeye Grill
  – Ursula’s Wine Bar and Café
  – Washington Square Bar & Grill
• Stillwater
  – The Green Room
  – Leo’s Grill & Malt Shop
• Downtown St. Paul
  – Burger Moe’s
  – Day by Day Café
  – Downtowner Woodfire Grill
  – Sweeney’s Saloon
Criteria for Restaurant Selection

• Geographic concentration
  – Coordination of services
• Type of restaurant
• Interest in organics reuse
Organic Waste: Restaurants

**Organic Waste:** Food Waste and Compost

**Food Waste:**
- Prep waste
- Customer plate waste
- Spoiled foods

**Compost:**
- Non-recyclable paper
- Napkins
- Paper towel
- Coasters
Replication Model Overview

1. Evaluate waste stream
2. Research end market options
3. Choose who to involve
4. Implement organics management program
Waste Evaluation: Restaurants

- What is the organic waste?
- Why is it generated?
- Where is it thrown away?
- How much?

Waste Chart*

<table>
<thead>
<tr>
<th>Date</th>
<th>Food Item</th>
<th>Weight</th>
<th>Spoilage</th>
<th>Prep Waste</th>
<th>Customer Plate Waste</th>
</tr>
</thead>
</table>

* Based on a chart provided within the EPA's Food Waste Audit Tool
### Volume of Waste

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Garbage Containers</td>
<td>Size of Garbage Containers</td>
<td>Frequency of Pickup Per Month</td>
<td>Volume of Waste Generated Per Month</td>
</tr>
<tr>
<td>1 container</td>
<td>8 cubic yards</td>
<td>8.66 pickups</td>
<td>69 cubic yards</td>
</tr>
</tbody>
</table>
Waste Composition: Restaurants

**MnTAP Waste Composition Study**
- Trash: 8%
- Napkins: 9%
- Food: 27%
- Recyclables: 56%

**EPA Waste Composition Study**
- Recyclables: 12%
- Trash: 14%
- Food and Napkins: 74%

## Composition of Waste

<table>
<thead>
<tr>
<th></th>
<th>Volume of Total Waste Generated per Month</th>
<th>Volume of Waste that is Food Waste (multiply A x 56%)</th>
<th>Volume of Waste that is Compostable (multiply A x 27%)</th>
<th>Volume of Waste that is Recyclable (multiply A x 8%)</th>
<th>Volume of Waste that is Trash (multiply A x 9%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>69 cubic yards</td>
<td>39 cubic yards</td>
<td>18 cubic yards</td>
<td>6 cubic yards</td>
<td>6 cubic yards</td>
</tr>
</tbody>
</table>

*Note: The calculations for B, C, D, and E are performed using the volume of total waste (A) and the specified percentage (56%, 27%, 8%, and 9% respectively).*
# Volume to Weight

<table>
<thead>
<tr>
<th>A</th>
<th>Volume of Food Waste per month</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>39 cubic yards</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B</th>
<th>Weight of Food Waste Generated per month (multiply A x 1,000 pounds)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>39,000 pounds</td>
</tr>
</tbody>
</table>
End Market Recommendations: Restaurants

• Source Reduction
  – Observe prep work
  – Monitor food orders
  – Rotate food
  – Modify portion sizes
  – Eliminate preventable waste
End Market Recommendations: Restaurants

• Donations
  – Call as needed for pickup
    • Un-served menu and buffet items
    • Un-served food from catered events
    • Surplus food inventory
  – Federal Bill Emerson Good Samaritan Food Donation Act
End Market Recommendations: Restaurants

- Beneficial Reuse
  - Feed Hungry People
  - Feed Animals
  - Industrial Uses
  - Composting
- Dependent on composition
- Work with multiple haulers

Minnesota Technical Assistance Program
www.mntap.umn.edu
Who to Involve: Restaurants

- Owner/manager
- Restaurant staff
- Technical assistance programs
- Current solid waste haulers
- Potential organic waste haulers
Implement: Restaurants

- Reduce food waste
- Monitor in-house recycling
- Coordinate with waste haulers
- Develop organics separation procedures
- Train and educate staff
- Continual measurement and evaluation
Restaurant Savings

• Annual average reductions of waste
  - Between 88 and 270 tons per restaurant
• Collective savings
  - $80,000
Implementation Challenges

- Limited space for bins
- Lack of route density
- Cost of organics pickup
- Waste separation
- Smell of containers
Personal Benefits

• Experience
  – Waste evaluation procedures
  – Organic waste disposal
  – Professional communication
  – Technical writing
• Chance to work with incredible people
  – THANK YOU!
Personal Benefits

Real work experience
- 10 site assessments
- Networking
- Waste composition study
- Technical writing

Thank you!
Questions?