SERDC Food Recovery Summit
The Role of Animal Feeding in Food Recovery
November 18, 2015
Organix Introduction

- Incorporated in 2009 for explicit purpose of diverting food waste from landfills
- Team has decades of experience developing and managing recycling programs
- Largest collector of grocery related food waste in the US, serving over 6,500 locations
- Operations in 36 states and Puerto Rico
- Over 500,000 tons diverted from the landfill annually
- Unique and highly specialized equipment designed specifically for the food waste recycling industry
- Developed proprietary recycling process to extract nutritional value from pre-consumer food waste
Safety and Nutrition Trial(s)
- Watonga, OK
- Dairy Study

Experts on Staff
- Regulations
- Reporting Requirements
- Rations (Feed Mixtures)

Challenges
- Containment
- Processing
- Contamination
- Market Limitations
Watonga, OK – Trial Completed By Bos Technica Research Services

Trial Methods

• Animals - 1500 head steers of Mexican origin (750 in Test Group “FRUIT” and 750 in Control Group)

• Initial BW = 595 lbs

• Facilities - 14 dirt-floored pens w/fence line bunks

• Diets - CONTROL = conventional feed yard diet and FRUIT = replaced 20% corn (DM) w/fruit and vegetable by product in top ration

• Roughage levels were similar (5.1% DM)

• Fat inclusion (CWG) was similar (DM) – FRUIT diet included more total ration fat due to fat content of product
# Safety and Nutrition Trials

## Trial Results

<table>
<thead>
<tr>
<th></th>
<th>CONTROL</th>
<th>FRUIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prime, %</td>
<td>0.41</td>
<td>0.21</td>
</tr>
<tr>
<td>Choice, %</td>
<td>49.69</td>
<td>51.98</td>
</tr>
<tr>
<td>Select, %</td>
<td>41.41</td>
<td>37.84</td>
</tr>
<tr>
<td>Standard, %</td>
<td>3.93</td>
<td>6.44</td>
</tr>
<tr>
<td>Commercial, %</td>
<td>4.55</td>
<td>3.53</td>
</tr>
<tr>
<td>Dark Cutters, %</td>
<td>1.45</td>
<td>2.29</td>
</tr>
<tr>
<td>Lights, %</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Heavies, %</td>
<td>2.48</td>
<td>2.49</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th></th>
<th>CONTROL</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Mortality, %</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Morbidity, %</td>
<td>3.30</td>
<td>1.86</td>
</tr>
<tr>
<td>Respiratory, %</td>
<td>3.09</td>
<td>1.65</td>
</tr>
<tr>
<td>Digestive, %</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Other, %</td>
<td>0.21</td>
<td>0.21</td>
</tr>
<tr>
<td>Removals, %a</td>
<td>0.41</td>
<td>0.41</td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th></th>
<th>CONTROL</th>
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</tr>
</thead>
<tbody>
<tr>
<td>In wt., lbs</td>
<td>327</td>
<td>327</td>
</tr>
<tr>
<td>HCW, lbs</td>
<td>845</td>
<td>850</td>
</tr>
<tr>
<td>Marbling score</td>
<td>403.12</td>
<td>408.49</td>
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<tr>
<td>Dress, %</td>
<td>65.61</td>
<td>65.74</td>
</tr>
<tr>
<td>ADCG, lbs/d</td>
<td>2.13</td>
<td>2.15</td>
</tr>
<tr>
<td>Feed:carcass gain</td>
<td>8.31</td>
<td>8.25</td>
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</tbody>
</table>
Safety and Nutrition Trials

Dairy Study – In Progress and is being completed by Dr. Froestschel, Ruminant Nutrition Consulting

Objectives:

• Establish a successful model of a dairy farmer using Fruit-plus as an energy supplement for their dairy herd.

• Determine the nutrient value of Fruit-plus fed included at 15% of the dry matter in total mixed rations for lactating dairy cattle.

• Measure the cost-benefit of Fruit-plus as an energy supplement for lactating dairy cattle.
Organix Has on Staff or Retainer
• 6 PhD Nutritionists
• 3 Animal Health Degreed Professionals
• 2 Environmental/Mechanical Engineers
• 2 EHS Professionals

Regulatory Oversight
1) EPA / State / Local
   • Solid Waste vs Product vs Recycling
     • Beneficial Use Permit
   • Storage of Product (Ground Water)
   • Building Permits

2) USDA / State Chemist / State Dept of Ag
   • Approved Labels – Minimum Guarantee
   • Tonnage Reports and Annual Registration Renewals
   • Ration Expertise (Animal Welfare)

3) FDA
   • FSMA
Challenges

Proper Containment

Winter

Summer

Concrete Containment Pad
Challenges

Screening and Processing

1. Reduces particle size - Less choking hazard and improved palatability
2. Makes product more uniform - Eliminates consistency issues of Raw product
3. Eliminates oxygen in wet products - Extends shelf life of product
4. Segregation of liquid - Makes product easier to handle
5. Reduces sorting of product - Helps make sure of even mixed TMR’s
Challenges

Contamination

Properly De-Packaged

Contaminated
Challenges

Key Controls To Prevent Contamination

• Store Training
  o New Hire
  o Refresher

• Locking Bins

• Standard Operating Procedures
  o Organix Employees
  o Generator Employees

• Corporate Support
  o Cultural Change
  o Program Ownership (Site Champion)
Challenges

Market Limitations

- **Seasonal Variance**
  - Feedlot Needs and Collected Volumes are Inverse by Seasonal Demands

- **Demographics**
  - Dense Human Population Areas are Typically Not Near Feedlots

Only Source Separated Pre-Consumer Fruits, Vegetables and Bakery can Be feed to Cattle. No Meats
Benefits of Grocery Unsold Product Going to Feed:

- Pre-consumer grocery food waste is a proven corn replacement in bovine diets.

- Provides feed savings for the farmer.

- Establishes outlet opportunities in areas where there are no composters or digesters.

- Eliminates the high tip fees at compost sites which in turn allows an affordable collection cost to the generator.

- Re-use of a product which contains energy back into the food chain instead of a landfill.
Organix Recycling, LLC
25609 Hickory Creek Drive, Suite 240
Mokena, IL 60448
708-326-9300
www.organixrecycling.com

Matt Hedrick, CSO, math@organixrecycling.com, 214-208-8407