

# Waste Audit

Charter Oak International Academy, PreK-5

October 22, 2018

## Project Summary

We have a waste problem – our school, our town, our world. Newspaper headlines reveal oceans filled with plastic (the largest of 5 plastic islands is twice the size of Texas) and straws strangling wildlife (550 mil thrown away daily), as well as microplastics clogging waterways, all having lasting damage on ecosystems. Whole, edible food feeds landfills when it could be feeding hungry children and families in our community. The market for recyclables changed dramatically when China stopped accepting the contaminated offerings of the US which will affect us locally if it hasn't already.

Students at Charter Oak, a world school focused on world concerns, made a commitment in 2015 to take an active role in reducing our waste footprint to combat climate change in solidarity with all nations participating in The UN Paris Agreement. A few examples:

- Students diverted veggie and fruit scraps to the garden compost and eventually began sending all food waste away for anaerobic digestion where it is used to make electricity (from bio gas) and a rich soil by-product.
- A RecycleCT grant funded the replacement of plastic utensils in the cafeteria with reusable metal utensils.
- Various student-led efforts have brought awareness to water conservation, playground litter, straw usage, vermiculture and more.
- In 2017-18, Charter Oak was recognized as a CT Greenleaf School.

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*We are dangerously close to being just another school with a failed recycling program.*

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*Charter Oak students eager to assist with tray sorting.*

Enthusiasm for these causes has remained high, yet motivation to do the real work has lagged if the contamination levels in school waste bins are any indication. We realized we are dangerously close to being just another school with a failed recycling program.

Our experiences helped us realize the importance of weaving sustainability

into our school culture! In 2018-19 we set a bold, big new goal of reaching Zero Waste within 3 years and a **Year 1 Goal to reduce school waste by 50%** with a simple message, “Think before you throw – it’s worth your time!”

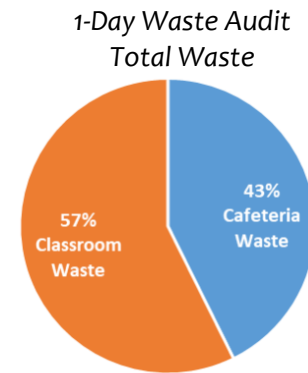
A Waste Audit was organized and conducted on October 22 to establish a baseline for our new sustainability planning effort which focused 3 waste strategies: 1) decreasing consumption, 2) increasing diversion to food recycling and 3) increasing diversion to traditional recycling. With the support and energy of key players – e.g. School Green Team, Administration and Faculty, Custodians, Nutrition Services, and WH Public Works – the Waste Audit would offer much needed direction and clarity in how to boost awareness, improve participation and eliminate confusion. A Waste Audit would also remind the entire community that our garbage does not simply disappear. In this case, all the waste that was collected was in the center of the playground for everyone to see, smell and count.



**Data at-a-glance**

| TOTAL WASTE (lbs)         | Food Scraps | Recycling | Trash | Edible Food Waste | TOTAL             |
|---------------------------|-------------|-----------|-------|-------------------|-------------------|
| Cafeteria waste           | 46.5        | 10.75     | 12.5  | 18.75             | 88.5              |
| (% Cafeteria waste total) | 53%         | 12%       | 14%   | 21%               | 100%              |
| Classroom waste           | 20.77       | 42.14     | 49.89 | 6.09              | 118.89            |
| (% Classroom waste total) | 17%         | 36%       | 42%   | 5%                | 100%              |
| Weights by category (lbs) | 67.27       | 52.89     | 62.39 | 24.84             | <b>207.39 lbs</b> |

- Based on a 180-day school year, **Total Annual Waste = 37,260 lbs**
- Waste per Student per Year = 70lbs, similar to national average. Projecting this across all WHPS elementary schools, **Total Annual Waste (all WHPS elementary) = 282,520 lbs**
- **Total Annual Edible Food Waste = 4,500 lbs**
- Food Waste per Meal (including Food Scraps and Edible Food Waste, based on 290 meal count) = .225 lbs/meal
- The cafeteria is the source of approximately 43% of school waste by weight which is consistent with national averages. Classroom waste includes various office spaces.
- Note: Observations regarding volume are important but were not captured in this waste audit for a few reasons. Future waste audits should include more opportunities for recording observations of volume.



Importantly, communication before and during the Waste Audit was minimized to help us get an accurate picture of the state of our waste bins and contamination rates.



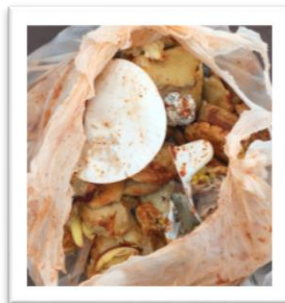
Students watch waste accumulate during Waste Audit.

Students in every classroom were able to participate by completing a Waste Audit spreadsheet (see Attachment A) in which they were asked to make observations about the waste bins – Trash, Recycling, and Food Waste. \*Note: due to tight scheduling, not every class was able to complete this exercise.

If the numbers are hard to grasp, please take a few minutes to review these photos and ask yourself, “Is this sustainable?”



Contamination in Mixed Recycling



Contamination in Food Waste



1-Day Edible Food Waste

Opportunities for Trash (landfill/incinerator) waste reduction fell into these three categories:

**Contamination.** There is a lot of contamination in Mixed Recycling bins especially in the classrooms which means the total weight of Trash is actually higher than the data shows. Is it education or indifference? Both must be addressed to affect the culture around waste disposal. These items include paper towels, recyclable containers like yogurt and drink bottles that still contain food remnants, snack wrappers, etc. Common questions include:

- Are paper towels recyclable? (No)
- What is the threshold for contamination levels in Mixed Recycling?
- Should we simplify recycling in classrooms and office areas to paper only?
- Can we get a school-specific “What’s in/What’s out?” recycling sheet?



PreK Trash Bin containing lots of Styrofoam trays.

**Food Waste.** The amount of food waste is overwhelming. Interestingly, we also saw a lot of edible food – whole fruits, cheese sticks, milks and more – being thrown away. We should be feeding bodies, not landfills! Common questions include:

- Can we save the edible, unopened food for others? (Yes)

- Do children have to take milks with their lunch? (No)
- What does 24 lbs of edible food waste equate to in wasted water and resources?

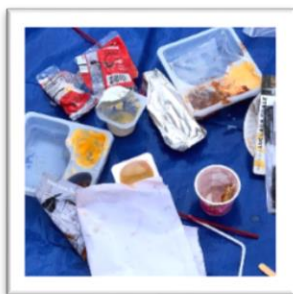
Single-Use Plastics. Straws, juice pouches and other single-use plastics find their way into every type of waste bin including Food Scraps and Mixed Recycling. These are plastic items that don't degrade and often make their way into our waterways or recycling machines causing lasting damage. Note: that the Waste Audit took place on a day when Styrofoam plates and bowls were not used in the cafeteria. The image above was taken in the PreK area which has limited ability and/or access to sorting. Common questions include:

- Can we eliminate straws from our cafeteria?
- Can we find an alternative to Styrofoam?

### **What's next?**

Students and Green Team leaders will continue to review the data, identify and prioritize possible solutions. Here is a list of potential projects for 2018-19, some already in development:

1. Food sharing/donation table – Already a work-in-progress. See Attachment C.
2. Student Lunch Monitoring programs in the cafeteria and classroom.
3. Food waste collection in classrooms – Attempted in 2017-18, back by popular demand.
4. Waste reduction in the cafeteria, e.g. 'litter-less or "zero waste" lunch' and 'Waste-Free Wednesday programs, are a few ideas already being discussed.
5. Food Waste Audit – an opportunity to understand why students are not eating their food. Based on results from other schools this information could have implications both in and out of the cafeteria.
6. Recess/Lunch swap – Children who are physically active consume more of their lunch.
7. Education - for the students and by the students will be a big part of any solution. This may include visits from experts in the field, signage, daily announcements, outreach to families and more.
  - Define 'wishful recycling?'
  - Promote "When in doubt, throw it out."
  - 5Rs – Refuse, Reduce, Re-use, Recycle, Rot



*Typical contamination of Mixed Recycling*



*Classroom Food Scrap bin with leftovers from snack*



*Snapshot of food waste from cafeteria.*

## **Conclusion**

A Waste Audit forces us to see and feel the effects of the habits of our disposable society. Students at Charter Oak at every age want to do the right thing! They are eager and hopeful and empowered when they learn how easy it is to have an impact on their community and their world every single day. The grown-ups need their creativity and optimism to remind us it is possible to adopt new habits that slow down the effects of Climate Change.

Waste Audits will be conducted at least 2x yearly with periodic cafeteria waste audits. We hope to capture more specific data on common items: paper, Styrofoam, plastic bags/film, etc. A final Waste Audit will be conducted at the end of the year to measure against our Year 1 goal of a 50% reduction in landfill/incinerator waste.

We also hope to share our experiences and invite other schools to begin planning their own Waste Audits and sustainability programs this year. A waste audit is a critical first step in establishing goals. Changing the culture is next. It is worth our time!



# Background

Charter Oak has taken our role as a CT Green Leaf school very seriously. This year we made the strategic decision to focus on Resource Management (Waste) to improve the sustainability of our school. Why? Elementary schools and especially cafeterias create a lot of waste and while Charter Oak diverts some mixed recyclables and food waste, we knew more work needed to be done.

Additionally, leaders of our town and state have dedicated a lot of resources to tackling the waste problem as well. Connecticut has pledged to divert 60% of food waste by 2024 from the waste stream and we believe this goal is only realistic by bringing our children into the equation. We have discovered at Charter Oak that children have an instinctive interest in and enthusiasm for stewardship of the land and the environment which makes them potentially the best and strongest leaders of this movement.

Please find an excerpt from the Charter Oak Sustainability Planning 2018-19 document below:

## Charter Oak – Sustainability 2018-19

**Vision:** Weaving peace and sustainability into our words, actions and culture.

**Mission:** As world citizens focused on world concerns, we seek to understand the environmental impact of our actions on the world around us and to make change to create a more peaceful and sustainable planet.

|                                     |           |   |                  |                                   |
|-------------------------------------|-----------|---|------------------|-----------------------------------|
| Resource Management<br><b>WASTE</b> | Nutrition | Environmental &<br>Sustainable Literacy | Green Purchasing | Air Quality<br>Eliminating Toxins |
|-------------------------------------|-----------|---|------------------|-----------------------------------|

|  |   |   |
|--|---|---|
| <b>STRATEGY 1:</b><br>Decrease consumption<br>(w/emphasis on Single Use Plastics)  | <b>STRATEGY 2:</b><br>Increase diversion to food recycling  | <b>STRATEGY 3:</b><br>Increase diversion to trad'l recycling  |
| <p><b>OBJECTIVE – improve awareness</b></p> <p><b>Cafeteria</b></p> <ul style="list-style-type: none"> <li>• Support <b>Metal Utensils</b> program</li> <li>• Launch <b>Food Sharing</b></li> <li>• Launch <b>"Litterless Lunch"</b> effort</li> </ul> <p><b>Classroom</b></p> <p>Provide educational materials to students and teachers like signage and video annc.</p> <p><b>Purchasing</b></p> <p>Provide educational materials (signage and literature) to faculty, staff, PTO, etc. that communicate sustainability objectives</p> | <p><b>OBJECTIVE – improve participation</b></p> <p><b>Cafeteria</b></p> <p>Continue to provide educational materials (signage, video annc., assembly skits, etc.) to decrease contamination</p> <p><b>Classroom</b></p> <p>Re-launch classroom food waste collection to build awareness</p> <ul style="list-style-type: none"> <li>• utilize collection buckets</li> <li>• provide educational materials to teachers &amp; staff</li> </ul> <p><b>Events</b></p> <p>Provide educational materials (signage and literature) to families and necessary waste bins</p> | <p><b>OBJECTIVE – eliminate confusion</b></p> <p><b>All</b></p> <p>Provide a thorough list of (traditional) recycling items increase participation and to prevent contamination. This will include educational materials (signage, video annc., assembly skits, etc.)</p> |

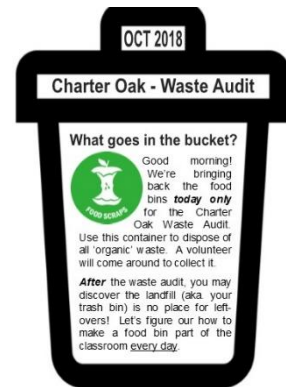
**Think before you throw.** **It is worth your time!**

**2018-19 SUSTAINABILITY GOAL:**  
Focus on achieving ZERO-WASTE in 3 years,  
with a 50% reduction at the end of year 1 (waste = 'trash')

The Waste Audit is intended to measure and motivate, to offer a 'provocation' in IB terms, to the entire Charter Oak community. Trash disappears way too fast from our tables, classroom and even our homes. A Waste Audit gives us a chance to really see WHAT and HOW MUCH we throw away.

# Our Method

1. Our goal was for the Waste Audit to be an honest reflection of the waste process at Charter Oak thus minimal student preparation was needed.
2. Collect waste in all areas of the school building:
  - Classrooms
  - Cafeteria
  - Office areas, etc. \*Includes staff lounge, copy rooms and more
3. Students, teachers and administrators were instructed to dispose of waste as usual. (See Attachment B for letter shared with faculty before the start of the Waste Audit.) One exception was a food bucket that was distributed to classrooms for Food Waste collection with instructions attached (see pic at right).
4. **Supplies:** Clipboards, classroom spreadsheets, extra paper for notes, pens, cameras, transparent bags, luggage scales (preferably digital to measure weights < 1lb) classroom buckets, labels, plastic gloves
5. In Classrooms:
  - At the end of the day we ask that 15 minutes is set aside to sort and track the following:






Step 1: examine the contents of the “trash” can. Are there any items that could have been sorted into Mixed Recycling or the Food bin? Please record your observations.

Step 2: examine the contents of the Mixed Recycling bin. Are there any items – contaminants like plastic bags, straws, bottle caps or food – that should have been sorted into Trash or Food bins? Please record your observations.

- Volunteers, including faculty and custodians, begin to collect, weigh and sort classroom waste near the end of day (approx. 2pm start).
- Weights were reported back to classrooms for further analysis.

Teacher: \_\_\_\_\_ Gr: \_\_\_\_\_

Weight (lbs): \_\_\_\_\_ Circle one:

6. In Cafeteria:
  - Similar to the Classroom, minimal preparation is needed for the cafeteria. Remind students and faculty that lunch clearing could take an extra few minutes.
  - Utilize existing sorting station to separate Food Scraps, Liquids (\*food waste weights do not include liquid waste), Mixed Recycling and Trash.

- Additional 5-Gallon buckets were used to collect only unopened, untouched Edible Food Waste.
- Volunteers collected waste from every bin except liquid waste after every lunch wave to record Grade totals. Sorted waste was weighed and photographed.



7. Custodians (extra help was allocated) continually removed waste to a central location for further inspection.
8. Final count
  - Custodians, Waste Audit volunteers, student volunteers gather in the central location to separate and weigh any items of particular concern, e.g. styrofoam plates, paper.
  - Photos:
    - Edible food waste
    - Contamination
  - Complete spreadsheets and provide summary to classroom teachers for analysis.

## Results

Students will apply transdisciplinary skills to analyze data from this experiment.

\*Additional data available.

- Develop a hypothesis – how much waste? What is our biggest waste driver by volume? By weight?
- Analyze results – add up all waste categories to find totals, present findings from each category as a percentage of the total
- Use results to extrapolate data and estimate elementary school waste in CT and the US. Find ways to make weight/volume real to students through comparisons, pictures, etc.
- Make predictions on how data would change at different times of year and why, different days of the week and why, different times of the month and why
- Use results to ask questions and find solutions from the world community that may help us reach our goals.

| <b>TOTAL WASTE</b>        | <b>Food Scraps</b> | <b>Recycling</b> | <b>Trash</b> | <b>Edible Food Waste</b> | <b>TOTAL</b> |
|---------------------------|--------------------|------------------|--------------|--------------------------|--------------|
| Cafeteria waste           | 46.5               | 10.75            | 12.5         | 18.75                    | 88.5         |
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| <b>Grade level Totals</b> | <b>Food Scraps</b> | <b>Recycling</b> | <b>Trash</b> | <b>Edible Food Waste</b> | <b>TOTAL</b> | <b>% of TOTAL</b> |
|---------------------------|--------------------|------------------|--------------|--------------------------|--------------|-------------------|
| PreK                      | 11.24              | 4.56             | 23.76        | 6.09                     | 45.65        | 28.0%             |
| K                         | 11.55              | 7.44             | 10.99        | 1                        | 30.98        | 19.0%             |
| Gr1                       | 9.4                | 2                | 3.5          | 2.75                     | 17.65        | 10.8%             |
| Gr2                       | 9                  | 2.3              | 2.02         | 3.5                      | 16.82        | 10.3%             |
| Gr3                       | 6.45               | 4.08             | 4.2          | 4                        | 18.73        | 11.5%             |
| Gr4                       | 5.75               | 1.18             | 2.19         | 3                        | 12.12        | 7.4%              |
| Gr5                       | 7.1                | 2.81             | 6.41         | 4.5                      | 20.82        | 12.8%             |
|                           |                    |                  |              |                          | 162.77       | 100.0%            |

## Sources

[www.ecocycle.org/bestrawfree/faqs](http://www.ecocycle.org/bestrawfree/faqs)

<https://www.usatoday.com/story/tech/science/2018/03/22/great-pacific-garbage-patch-grows/446405002/>

<https://www.pca.state.mn.us/waste/school-waste-study>

<http://www.courant.com/news/connecticut/hc-news-plastic-bans-campaigns-20180910-story.html>

# Attachment A

## Sample Classroom Waste Audit Spreadsheet

|  |   |  |  |
|--|---|--|--|
| Date:  |   | IMPORTANT: DO NOT move anything from one bin to another as you do this worksheet with your class. We want to get an accurate picture of what our trash looks like!   |  |
| Teacher/Grade:   | Morris/4th  |  |  |
| # of students  | 19  |  |  |
| Bin  | RECYCLING   | TRASH  | FOOD   |
| <b>1. Observations</b>   |   |  |  |
| 2. Record observations about each bin here   |   |  |  |
| What is in the bin?  | <ul style="list-style-type: none"> <li>• Paper</li> <li>• food wrapper</li> <li>• ziploc</li> <li>• Juice carton</li> </ul> | <ul style="list-style-type: none"> <li>• Plastic fork</li> <li>• ziploc</li> <li>• Grocery bag</li> <li>• Juice box</li> <li>• Paper towel</li> <li>• Mini oreos</li> <li>• Rice krispy treat</li> <li>• Food scraps</li> <li>• Napkin</li> <li>• Sticky note</li> <li>• Paper clip</li> <li>• Tissue</li> <li>• pear</li> </ul> | <ul style="list-style-type: none"> <li>• Pieces of a cookie</li> <li>• Apple core</li> </ul> |
| What is in this bin that should not be?  | <ul style="list-style-type: none"> <li>• Food wrapper</li> </ul>  | <ul style="list-style-type: none"> <li>• Ziploc</li> <li>• Plastic fork</li> <li>• Pear</li> <li>• Rice krispy treat</li> <li>• Sticky note</li> <li>• Juice box</li> <li>• Food scraps</li> <li>• Mini oreos</li> <li>• Grocery bag</li> </ul>  |  |
| <b>2. Photos</b>   |   |  |  |
| Take photos of each bin and upload them to the Waste Audit Photo folder. Name with teacher and types. (i.e. Hawkins Recycling) |   |  |  |
|  |   |  |  |
| 3. Volume--Rank your bins 1-3 based on the amount of stuff in each. 1=most stuff, 3=least stuff                                |   |  |  |
| Rank (1-3)   | 2   | 1  | 3  |
| Estimate how full your bins are: ¼, ½, ¾ or FULL!  |   |  |  |
| Estimate   | 1/2   | 3/4  | 1/4  |

\*Special thanks to Catherine Diviney from Public Works for creating the classroom waste audit form.

# Attachment B

----- Forwarded message -----

From: **Kirsten Sanderson** <[kirsten\\_sanderson@whps.org](mailto:kirsten_sanderson@whps.org)>

Date: Sun, Oct 21, 2018 at 8:15 AM

Subject: Waste Audit Monday

To: <[CharterOak@whps.org](mailto:CharterOak@whps.org)>

Hello, All!

Tomorrow is our school wide waste audit. With help from our district custodial and energy conservation team, we will be coming to classrooms tomorrow afternoon to weigh your recycling, trash and food waste. (Mini compost bins will be delivered to your rooms first thing in the morning. Many of you have been requesting them!)

Here is the breakdown of what we'd like you to do:

1. During the day, everyone should use waste bins as usual, with food waste going in compost bins (as we did last year). We will be weighing trash in the cafeteria at every lunch wave so we will be asking our cafeteria helpers to support with this.
2. Some time in the afternoon, take a few minutes to observe, discuss and photograph what is in each bin. (See below for your weigh-in times) Please don't correct any "accidents" at this time.
3. Record what you see (in an age-appropriate way--modify as you wish) on the classroom waste audit worksheet, which I will share electronically with you.
4. When we come, we will quickly weigh, record and remove your waste with help from parent volunteers and extra custodians from the town.

Waste will then be brought out to the compass rose to allow for observation and analysis by our Deep Roots volunteers. If you'd like to walk your students through that areas after 3:00, please do. We will also take pictures to share with our community and to use for goal setting.

Here are the weigh-in times by grade level:

1:45 Kindergarten

2:00 Grade 5

2:10 Grade 4

2:20 Grade 3

2:30 Grade 2

2:45 Grade 1

2:55 Pre-K

Non-grade level rooms will be gathered as we pass by or possibly after school. Our goal is to collect all waste!

If your time is a problem, please send me an email and we will adjust.

THANKS!

Kirsten

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**Kirsten Sanderson**

International Baccalaureate Coordinator

Charter Oak International Academy

(860) 233-8506

# Attachment C

Food Share/Donation Guidelines developed with WH Nutrition Services and Board of Health.

## FOOD SHARE/DONATION GUIDELINES FOR CHARTER OAK INT'L ACADEMY

**Why Food Donation?** Let's feed bodies, not landfills! Everyday whole, edible food is being thrown away in our cafeteria. Did you know it takes 25 gallons of water to grow just 1 apple? This is not a sustainable system. At Charter Oak we have worked hard to divert food scraps from the trash can, now we can get closer to the heart of the problem by offering a Food Share table. When combined with educational efforts, food share tables can keep food out of garbage cans and in the hands of children who need it; help students better understand their bodies and how to make healthier food selections; and have an immediate and long-lasting impact on our community and our world.

### Sharing Table Checklist

- The table should be close to the cashier or wherever students exit the food service line.
- The sharing table must be monitored by any faculty or staff member or adult volunteer other than the cashier.
- Food or beverages that must be under temperature control (e.g., milk, cut fruit) must be placed in a small refrigerator, cooler or ice bath.
- Recovered food and beverages should be clearly labeled and not mixed with unsold foods.
- Rules and limitations (e.g. # of visits per lunch period) should be clearly posted.

### Food Safety Checklist

- Students should place their unwanted food onto the sharing table before sitting down to eat. This will prevent any potential contamination.
- The monitor should identify any food, beverage, or condiment to make sure it has not been contaminated (e.g., opened, partially eaten, etc.) and the original packaging is in sound condition.
- Unused food should be donated rather than thrown away. USDA regulations allow donations, such as packaged foods, whole fruits and vegetables, and milk nearing expiration, to 501c3 non-profit organizations.
- Students may not be allowed to put items brought from home on the sharing table.

### Best Practices



Sharing Tables in combination with Offer Versus Serve (OVS)\* will effectively combat excess waste on trays.

\*OVS is a provision that allows students to accept 3 of 5 required lunch components; these components are meats/meat alternates; grains; fruit; vegetables; and fluid milk. One selection must be at least ½ c. fruit or veggie.

- Post clear and concise signage with tray selection tips (OVS) and Sharing Table rules.
- Educate school community with new processes, snack tips

QUESTIONS? Contact WHPS Nutrition Services, 860.561.6600.

### ALLOWABLE FOODS

- Non-temperature-controlled, pre-packaged products:
  - food bars
  - crackers
  - cereal packs
  - bagels
- Fruit with a thick skin, like bananas and oranges
- Temperature-controlled, pre-packaged products:
  - cheese sticks
  - yogurt
  - fruits or veggies
  - milk and juice

\*items in this list must be placed in a cooler, refrigerator, or ice bath

### MORE IDEAS

Looking for more ways to minimize wasted food?

- Market the SHARING TABLE program
- Increase food choices
- Changing food presentation
- Allowing appropriate time for meals