Estimating the amount of wasted food

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Food Waste observed at Household waste analyses

Freiburg, DE
Food Waste observed at Household waste analyses

Cambridge, UK
Food Waste observed at Household waste analyses

Neyagawa, JP
How much food gets wasted?

Method 1: Food supply - intake balance

Method 2: Waste Composition Analysis

(Method 3: Food loss survey)
Method 1 - Food supply and intake approach

Japan 2007:  
Supply  2551kcal/day/person (MAFF survey)  
Intake  1841kcal/day/person (MHLW survey)  
Difference  710 kcal (25.5% of supply)  
= wasted edible food(?)

In weight  
Supply 1578g : Intake 1450g (water is added in cooking)  
710kcal / 1.309kcal/g = 540g

MHLW- household survey (3586hhs in 2007, age 1~100+, bias? )  
householders record what they used for meal preparation, +interview by nutritionist

MAFF - FAO standard procedure, includes production, import, export, etc.  
Applies "standard yield" in cooking; eg. 90.6% of potato is edible  
*supply includes loss in distribution only between farm and market
"big picture" of supply and intake

Additional remarks on "lost edible food"

* breakdown into detailed food items
  - very difficult (supply is ingredient, intake is dish)

* breakdown into nutritional contents: fat lost more than protein
Time Series of Supply, Intake, and Difference (loss)
### Method 2 - Waste composition analysis

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>Potentially Edible</th>
</tr>
</thead>
<tbody>
<tr>
<td>Household 711g¹ x 35%²</td>
<td>249g</td>
<td>106g</td>
</tr>
<tr>
<td></td>
<td></td>
<td>analysis result: 42.6% of total food waste ⁴</td>
</tr>
<tr>
<td>Commercial restaurants 68.5g</td>
<td>29g</td>
<td>apply household results</td>
</tr>
<tr>
<td>Commercial stores 68.5g</td>
<td>68.5g</td>
<td>mostly shelf leftovers</td>
</tr>
<tr>
<td>Industrial (food processors) 106g</td>
<td>0g</td>
<td>mostly preparation loss</td>
</tr>
<tr>
<td>Total</td>
<td>491g</td>
<td>203.5g</td>
</tr>
</tbody>
</table>

[g/day/person]  Japan, 2006

1) National waste statistics (MoE, 2008)
2) Representative percentage from various analysis results (Takatsuki, 2008)
3) "Survey on the cyclical use of food resources" (MAFF, 2008)
4) Takatsuki (2006)
Household waste composition analysis: breakdown of "kitchen waste"
Estimates from Compositional analysis less than 1/2 x [Supply - Intake method] eg. potentially edible food waste 204g(comp): 540g(supp-int) (Factors to be considered: disposers, non-municipal composting? other food waste sources? food Intake negatively biased?)
International comparison

UK (2005) household waste 1400g/day/person (DEFRA 2006)
food 19% (WRAP 2006) = 269g

FAO food supply 3440 kcal (2003)

DEFRA nutrient intake survey is based on household expenditure survey
(wastage at household assumed 10%) 2320 kcal incl alcohol (2007)
(DEFRA, 2008) 1120 kcal (33%) lost in distribution?

National Diet & Nutrition Survey (ONS, 2000) 1832 kcal (19-64 yrs)
Amount wasted at households not only 10% of purchase? = 665 kcal(27%) WRAP(2008) “The food we waste” 1/3 of the food we buy, we throw away
Method different from Japan, not directly comparable?

FAO supply figures - Austria: 3740 / USA: 3770 / Germany 3490 etc.

Intake – demographic composition / physical labour %
(not much difference within industrialised countries?)
**Foodstuff recycling law (Japan, 2001)**

* Hierachy: reduce - feed - fertiliser - energy
* “reduce” difficult to measure – no target at the moment
* Each company is to conduct at least 20% recovery - current compliance only 18%; i.e. few companies with high recovery rate
* >100t/year generator of food waste must report to government (incl franchise as whole)

<table>
<thead>
<tr>
<th></th>
<th>share of f/waste</th>
<th>recovery rate</th>
<th>methods of recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>fertiliser</td>
</tr>
<tr>
<td>food processing</td>
<td>43</td>
<td>72</td>
<td>45</td>
</tr>
<tr>
<td>wholesale</td>
<td>27</td>
<td>56</td>
<td>48</td>
</tr>
<tr>
<td>retail</td>
<td>23</td>
<td>28</td>
<td>56</td>
</tr>
<tr>
<td>restaurants</td>
<td>7</td>
<td>15</td>
<td>62</td>
</tr>
<tr>
<td>total</td>
<td>100</td>
<td>46</td>
<td>48</td>
</tr>
</tbody>
</table>

Other efforts:
* Food education in national primary school curriculum to include unwasteful use of food
To Conclude

* Several methods to estimate food loss – close look needed
* As much as 25% of total food supply may be wasted in Japan.
* Waste composition analysis indicate lower figure.
* Further investigation into explanation for difference between the two methods would be useful.

* International comparison – difficulty: method of dietary survey varies very much between countries.
* Looking at trends (time series) may be easier – which country have managed to decrease food waste?