The True Cost of Food Waste

Professor Lisa Jack
Previous Work

• Researching the food industry for 20 years – accounting, performance measurement

• Contributed to the ‘Elliott Review’ on food fraud; ‘The Cost of Food Crime’ for the FSA (pending)

• Leading the ‘Food Cultures in Transition’ research group at UoP – over 35 researchers interested in and knowledgeable about people’s behaviour around food systems past, present and future.
Previous Work – True Cost of Returns

To paraphrase a quote from the 1930s (Adrian Bell, *Silver Ley*):

The customer:

• “For the privilege of buying a chicken prepared for the oven whenever you want you have to pay for all the days the chicken was there and you didn’t want it.”

The Store (food waste adaptation):

• “For giving the customer the opportunity to buy what they want, when they want, you have to pay for all the days that they leave you to dispose of the surplus.”

[Image of the book cover: *Buy Online, Return in Store*]

By
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## True cost of returns model – our starting point

### Total Cost of Returns 80/20 Model

<table>
<thead>
<tr>
<th></th>
<th>BASELINE</th>
<th><strong>WHAT IF 1</strong></th>
<th><strong>WHAT IF 2</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sales price of item</strong></td>
<td>€ 89.00</td>
<td>€ 89.00</td>
<td></td>
</tr>
<tr>
<td><strong>Cost of item</strong></td>
<td>€ 29.00</td>
<td>€ 29.00</td>
<td></td>
</tr>
<tr>
<td><strong>Rate of returns</strong></td>
<td>20%</td>
<td>20%</td>
<td>0%</td>
</tr>
<tr>
<td><strong>% online purchases returned via store</strong></td>
<td>50%</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td><strong>% online purchases returned via other route</strong></td>
<td>50%</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td><strong>% return items resold at full cost</strong></td>
<td>89%</td>
<td>89%</td>
<td>89%</td>
</tr>
<tr>
<td><strong>% return items not resold at full cost</strong></td>
<td>11%</td>
<td>11%</td>
<td>11%</td>
</tr>
<tr>
<td><strong>Average value received as % of full sales down price</strong></td>
<td>66%</td>
<td>66%</td>
<td>66%</td>
</tr>
<tr>
<td><strong>Cost of lost sales</strong></td>
<td>€ 30.26</td>
<td>€ 30.26</td>
<td></td>
</tr>
<tr>
<td><strong>Average cost to cover free returns of behalf of customer</strong></td>
<td>€ 6.00</td>
<td>€ 6.00</td>
<td>€ 6.00</td>
</tr>
<tr>
<td><strong>Transaction cost per item for administration</strong></td>
<td>€ 7.00</td>
<td>€ 7.00</td>
<td>€ 7.00</td>
</tr>
<tr>
<td><strong>Transaction cost per item for returns centre</strong></td>
<td>€ 1.80</td>
<td>€ 1.80</td>
<td>€ 1.80</td>
</tr>
<tr>
<td><strong>Cost per item of handling returns in Store</strong></td>
<td>€ 0.90</td>
<td>€ 0.90</td>
<td>€ 0.90</td>
</tr>
<tr>
<td><strong>Total cost of return</strong></td>
<td>€ 7.34</td>
<td>€ 7.34</td>
<td>€ 7.34</td>
</tr>
<tr>
<td><strong>% Improvement in gross profit</strong></td>
<td>-</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td><strong>Maximum possible rate of return</strong></td>
<td>78%</td>
<td>78%</td>
<td>78%</td>
</tr>
</tbody>
</table>

**Key Performance Indicator**

**ONLY CHANGE DATA IN YELLOW HIGHLIGHTED CELLS**
Example possible costs and losses food waste

Additional costs from waste
- Incremental IT development, maintenance & support, admin
- Additional costs of handheld & desktop devices
- Security and storage of items in store before disposal – new assets
- Wrap & packaging/unwrapping
- Transportation
- Additional staff costs
- Opportunity costs
- Cost of management time

Increased losses from waste
- Increased write offs for foods
- Increased internal theft
- Increased loss of inventory/replacement costs

Consequential losses from waste
- Foods sent to recycling / landfill that could have been sold
- Commercial income lost
To calculate cost of waste you might need:

<table>
<thead>
<tr>
<th>Sales price of item</th>
<th>Transaction cost per item of handling waste in Store (additional staff cost; security etc)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of sales of item</td>
<td>Transaction cost per item for administration</td>
</tr>
<tr>
<td>Commercial income related to item</td>
<td>Transaction cost per item IT provision</td>
</tr>
<tr>
<td>Cost of discounts given</td>
<td>% food wasted in store because unsellable</td>
</tr>
<tr>
<td>Costs of disposal – fees, transportation, etc</td>
<td>% food wasted in store because slow moving/obsolete</td>
</tr>
<tr>
<td>Average net Income per item from 3rd party (positive) or cost of waste disposal (negative)</td>
<td>% food wasted because of damaged packaging</td>
</tr>
<tr>
<td>Operating margin %</td>
<td>% foods sold at reduced rate</td>
</tr>
<tr>
<td>Net margin before tax %</td>
<td>% redistributed to people</td>
</tr>
<tr>
<td>No of food items in total</td>
<td>% sent to animal feed/reseller (income)</td>
</tr>
<tr>
<td>No of food items sold</td>
<td>% recycled (including energy recovery)</td>
</tr>
<tr>
<td>No of items returned via home delivery</td>
<td>% thrown away</td>
</tr>
<tr>
<td>Average wage with on-costs</td>
<td>rate of disposal (items lost/total no items)</td>
</tr>
<tr>
<td>Increase or decrease in rate of disposals estimated as a result of an initiative.</td>
<td></td>
</tr>
</tbody>
</table>
Trial run figures for one SKU

- For a retailer with 0.8% rate of food waste, 10% gross profit margin, 2% operating profit margin, 1% net profit margin. Item retailing at £1.20. 1.5m items available for sale.

- Cost of disposal to be provided for even if 0% waste is £0.01 per item

- Maximum level of disposal before overall losses 16%
  An improvement in the rate of food waste of just 0.005% has the potential for a 200 basis point increase in net profit.

- Key factors: rate of waste, income from disposal, cost of disposal, incremental cost of additional infrastructure.
Comparison to WRAP equation

- WRAP equation is global.
- Our equations would work at SKU, Store, Company level.
- Breaks down different entry and exit routes for waste.
- Better idea of incremental costs.
- Looks at rates of disposal effecting net margins.
- Tells you what to track.
- Enables what-if analysis.
Benefits of knowing the cost of food waste

- Provide reasons to unlock investment for prevention
- Places a value on prevention work
- Places a value on philanthropic work
- Identifies net margin savings and other cost-benefits
Ben Dingley

• Zero Food Waste Leader – Tesco UK
Questions for the Audience

What benefits do you see in this research?

What implications and actions could you imagine arising from the research and its findings?

What would be the most interesting categories to start on?

Write comments in the Chat/Q&A box or indicate you’d like to speak!
Getting involved

**Case studies:**
*detailed interviews, round table discussions and site visits with 4 retailers*

Around 4 days input over 6 months.

**Short, structured interviews:**
*telephone/online questionnaire based discussions*

Around 20-40 minutes

**Desk based development:**
*creation of a True Cost of Waste model.*

Sharing and/or testing model over 12 months.
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