Contractual Terms for Reducing Food Waste
Possibilities and Potential within Fresh Grocery Supply Chain
An estimated 63 MN tons of food amounting to $218 MN value is wasted annually in the US.

### Where does food waste occur (in % weight)

- Total: 100%
- Farms: 16%
- Manufacturers: 2%
- Consumer Facing Businesses: 40%
- Homes: 42%

Retailers can directly affect wastages.

Retailers may nudge behavioral change.

### How much more can retailers prevent? (in % weight)

- Retailers have made significant progress in reducing waste within their boundaries.
- However, only 23% of the food waste before it reaches the consumer’s homes happens within the stores.
- Objective of this study is to identify ways in which retailers can reduced the remaining 77% which amounts to ~28 MN tons by weight.
Approach and Methodology

A combination of semi-structured interviews and desk research was used to compare, and contrast strategies being used by several retailers/suppliers.

Number of interviews conducted...
Primary causes of food waste (1/3)

*Extensive downstream (customer) centricity*

Let us consider an example of stocking 10 loaves of bread at costs 2 cents to bake and 1 cent to dispose at a Selling Price of $2 ...

<table>
<thead>
<tr>
<th>Sales Volume</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waste Volume</td>
<td>9</td>
<td>8</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Sales Value ($)</td>
<td>2.0</td>
<td>4.0</td>
<td>6.0</td>
<td>8.0</td>
<td>10.0</td>
<td>12.0</td>
<td>14.0</td>
<td>16.0</td>
<td>18.0</td>
<td>20.0</td>
</tr>
<tr>
<td>Cost of sales ($)</td>
<td>0.2</td>
<td>0.4</td>
<td>0.6</td>
<td>0.8</td>
<td>1.0</td>
<td>1.2</td>
<td>1.4</td>
<td>1.6</td>
<td>1.8</td>
<td>2.0</td>
</tr>
<tr>
<td>Cost of Waste ($)</td>
<td>1.8</td>
<td>1.6</td>
<td>1.4</td>
<td>1.2</td>
<td>1.0</td>
<td>0.8</td>
<td>0.6</td>
<td>0.4</td>
<td>0.2</td>
<td>0</td>
</tr>
<tr>
<td>Cost to Disposal ($)</td>
<td>0.9</td>
<td>0.8</td>
<td>0.7</td>
<td>0.6</td>
<td>0.5</td>
<td>0.4</td>
<td>0.3</td>
<td>0.2</td>
<td>0.1</td>
<td>0</td>
</tr>
<tr>
<td>Profit After Exit Costs</td>
<td>-0.9</td>
<td>1.2</td>
<td>3.3</td>
<td>5.4</td>
<td>7.5</td>
<td>9.6</td>
<td>11.7</td>
<td>13.8</td>
<td>15.9</td>
<td>18.0</td>
</tr>
</tbody>
</table>

Sale of only 2 loaves of bread can cover the cost of stocking 10 loaves of bread

*Imagin every player in the supply chain making a similar computation!*
Primary causes of food waste (2&3/3)

Limited upstream (producer) centricity

Traditional contracts between the retailers and producers take the shape of fixed quantity of a pre-defined quality for a fixed price over a given time period

- Produce left at farm in crop flush
- Crop Rejection due to cosmetic reasons
- Producers usually disaggregated. Unable to find alternate avenues to sell.
- Opportunity cost paid by both retailers and consumers

What if the fixed nature of these contracts was relaxed?
### Forward Contract Types (Prevention)

**Whole Crop Purchase Contracts**
- Retailer promises to buy the entire crop produced by the farmers without sorting
- Retailer re-distributes produce to be displayed on shelf and to be used elsewhere
- Effective in cases where retailers have an in-store kitchen, restaurant or possess a strong downstream network of hotels and restaurants, upstream networks with farmers

**Investment Contracts**
- Retailer and the supplier jointly identify opportunities to reduce waste
- Incentives to collaborate materialized using long term price or quantity contracts
- Effective in cases which require sizable capital investments by either party. Ex - modifications in packaging.

**Scanned Based Trading**
- Retailer acts only as a shelf space provider
- Supplier manages inventory from end-to-end
- Retailer gets a fixed commission for every $ of commodities purchased
- Effective when suppliers’ ability to forecast aggregate demand is higher – better forecast, lesser wastage. Ex -
  - Geographical areas with limited store presence of retailer
  - Commodities with high demand fluctuations at individual store level
Contract Types (1/2)

Whole crop purchases seem to hold the highest potential in reducing overall food waste among forward contract types

Motivation for different players to reduce food waste...

<table>
<thead>
<tr>
<th>Contract Type</th>
<th>Producers</th>
<th>Retailers</th>
<th>Example (for fruits @ Tesco)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whole Crop Purchase</td>
<td>![Up Arrow]</td>
<td>![Up Arrow]</td>
<td>Collaborates with A Gomez to sell imperfect fruit under Wonky and Farm Brand lines. Uses blemished and damaged fruits in chopped and prepared lines</td>
</tr>
<tr>
<td>Scan Based Trading</td>
<td>![Down Arrow]</td>
<td>![Down Arrow]</td>
<td>Increase direct deliveries from AMT Fruits to extend shelf life in stores</td>
</tr>
<tr>
<td>Investment Contracts</td>
<td>![Down Arrow]</td>
<td>![Up Arrow]</td>
<td>Invested in vacuum “skin packaging” to increase shelf life and reduce food waste up to 50% with Hilton Foods</td>
</tr>
<tr>
<td>Traditional Fixed Price Contracts</td>
<td>![Up Arrow]</td>
<td>![Down Arrow]</td>
<td></td>
</tr>
</tbody>
</table>
A hybrid possibility of whole crop purchases with a significant reduction in logistical complexity could be Conditional Contracts

- Retailer makes Whole Crop Purchases a pre-condition for suppliers to be eligible for bidding contracts
- The pre-conditions may also be extended to other avenues of streamlining operations for reducing food waste
- Effective in cases where there is a significant bargaining power difference between retailers and suppliers
Contract Types (2/2)

ReSale Contract Types (Recovery and Recycle)

- Retailer ships back left-over commodities to suppliers pre-determined constraints
- Constraints, cost of logistics and buy back price are pre-negotiated in contracts
- Supplier re-distributes or re-processes the commodities thus received
- Effective when suppliers’ ability to process left-over inventory is higher. Ex –
  - When suppliers possess strong downstream network of discount stores
  - When suppliers are manufacturers who can re-process the commodities approaching expiry

Backward Selling Contracts

Forward Selling Contracts

- Retailer identify players in downstream who have utility for unsold produce
- Not very popular among large retailers as they prefer to slash prices and push sale within the firm
- Gaining popularity in recent times with the advent of waste utilization start ups
Implementation Road Map

Key to success of most aforementioned contract types is seamless sharing of information

- Identify avenues with the highest waste reduction potential
- Assess the context and capabilities of all players involved
- Enlist the pre-requisite of all contract types to identify the one matching closely with the context
- Engage all players involved and invest in information sharing strategy
- Run small pilots to monitor the progress