Food Waste in the Online Grocery Supply Chain: The Case of Ocado’s Salads

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Presentation structure

• Project description

• Project approach

• Research findings – salad waste across the Ocado supply chain and potential mitigation measures

• Managerial implications

• Project outputs and report/case study brief
Project description

• The project is championed by two Ocado departments, supply chain and CSR;

• The total funding awarded to CARBS is £50K, though the project aspires to be the start of a long-term joint research collaboration among Ocado, CARBS and WRAP;

• The project aims to design a food waste measurement tool for Ocado’s perishable food categories, and test that tool in specific salads categories;

• The project also aims to generate a best practice guide, and case study to be published in the Ocado 2018/2019 CSR report; and;

• The project outputs generated are being/will be disseminated via the ECR Shrink Group, IGD and WRAP.
Data collection

Suppliers:
- 20 invited
- 5 participated in a survey
- 2 participated in interviews & provided data

Ocado:
- Supply
- Sales
- Waste
- Forecast

Customers:
- 9,000 invited
- 1,000 responded

Waste measurement tool

Total waste
CO2e
Blue waster footprint

Inventory/Waste simulator tool

Ocado’s waste / inventory

Recommendations to reduce food waste

Improved replenishment policy
Research findings – salad waste measurement & mitigation
Overall results - Shared waste against total production output across the Ocado salad supply chain

Average (%) total waste at suppliers, Ocado and customers.
Stage 2 results - Share of waste (%) in Tonnes across the Ocado supply chain

In conventional UK retail supply chains, the average % of products donated to charity/binned is about 1%

<table>
<thead>
<tr>
<th>Salad category</th>
<th>Supplier crop waste (%)</th>
<th>Ocado salad waste (%)</th>
<th>Customer salad waste (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mixed leaves</td>
<td>23.4</td>
<td>0.065</td>
<td>12.4</td>
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<tr>
<td>Lettuce</td>
<td>16.1</td>
<td>0.096</td>
<td>12.0</td>
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<tr>
<td>Tomatoes</td>
<td>11.6</td>
<td>0.026</td>
<td>13.1</td>
</tr>
</tbody>
</table>

Could managers from retailers in the audience share with us their company share of waste across these salad categories?
Top causes of food waste: supplier’s perspective

<table>
<thead>
<tr>
<th>Cause</th>
<th>Number of suppliers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor demand forecast</td>
<td>5</td>
</tr>
<tr>
<td>Poor quality, reject by retailers.</td>
<td>3</td>
</tr>
<tr>
<td>Inefficient information sharing between farmers and retailers (lack of visibility)</td>
<td>3</td>
</tr>
<tr>
<td>Issues like mould and diseases</td>
<td>2</td>
</tr>
</tbody>
</table>
Top causes of food waste: customer’s perspective

- Not enough quality / time
  - Not using in time due to quality e.g. bruising, limp, browning, mouldy
  - Not using in time because didn’t fancy eating it
- Customer behaviour
- Improper Pack size
- Customer behaviour

- 31% Not enough quality / time
- 28% Customer behaviour
- 22% Improper Pack size
- 19% Customer behaviour
Current food waste mitigation actions by suppliers and customers

Suppliers:
- Compost: 25%
- Anaerobic digestion (the process by which organic matter such as animal or food waste is broken down to produce biogas and bio-fertilizer): 13%
- Charities: 25%
- Energy generation (e.g., renewable): 37%

Customers:
- Dispose: 40.30
- Pet food: 3.30
- Collection: 40.43
- Compost: 15.97

Waste destinations:}

Compost

Anaerobic digestion

Charities

Energy generation (e.g., renewable)
### Causes, potential projects & Ocado’s stand

<table>
<thead>
<tr>
<th>Top causes</th>
<th>Future actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measurement methodology not developed for online grocery SCs</td>
<td>Refine the food waste measurement tool developed for other UK online grocery retail supply chains. Ocado will be leading a joint effort inputs from WRAP &amp; CARBS via IGD.</td>
</tr>
<tr>
<td>Fluctuated Ocado orders to suppliers</td>
<td>Design and run a pilot project to assess different perishable product supplier order forecasting and inventory control models.</td>
</tr>
<tr>
<td>Crops affected by weather are not considered in forecasting policy</td>
<td>Extend waste-reduction decision-making of promotions Ocado has to include suppliers the forecast of weather-sensitive crops</td>
</tr>
<tr>
<td>Product specifications can become more flexible</td>
<td>Design a customer questionnaire to identify and eliminate unnecessary product characteristics</td>
</tr>
<tr>
<td>Lack of information visibility</td>
<td>Provide more suppliers with earlier visibility of Ocado orders by extending the existing Vendor Managed Inventory System</td>
</tr>
<tr>
<td>Deviation between supplier order and quantity received at CFCs</td>
<td>Design and run a transport routing modelling-based research project to identify supplier network planning models that could reduce the deviation between supplier order and quantity received at CFCs.</td>
</tr>
</tbody>
</table>

Based the causes and sources of waste we found, do you have any advice on specific follow-up projects we could pursue?

| High priority/short-term | High priority/medium-term | Low to medium priority/medium-term |
Simulation model results:
Sales against forecast
Simulation model results: Sales versus supplier orders & inventory

Is the significant level of demand amplification we found avoidable?
Do you have any suggestions on how to reduce it?
Simulation model results:
Proposed model

Order-up-to policy introduce to Ocado with the aim of making the Ocado order changed with shorter forecast of customer orders
Managerial implications

- Who is wasting?
- Where is food waste going to?
- Where is food waste coming from?
- How much food is being wasted?
- What is the economic and environmental implications of wasted food?
- Why food is wasted?
- What is the relationship between inventory and food waste?
Additional questions for you

• Any lessons learned from your own ecommerce operations on these three categories that you could share with us?

• Has anything been done on these salads categories to get the right size packs to the shopper to reduce waste?

• What about the famous spray to make your salads last ten days longer discussed during the June ECR meeting?
Project outputs

**Food waste measurement tool**

**Inventory/waste simulator**

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<tr>
<th>Sales</th>
<th>Forecast</th>
<th>Forecast Error</th>
<th>Order</th>
<th>Receipt</th>
<th>Inventory-4</th>
<th>Inventory-3</th>
<th>Inventory-2</th>
<th>Purge</th>
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</tr>
</tbody>
</table>

**The Three P’s of Sustainability**

- **Economic**
  - Supplier waste (%)
  - Customer waste (%)
  - CO2 emissions (tonnes/yr)
  - Plastic waste (tonnes/yr)

- **Environmental**
  - Supplier waste (%)
  - Customer waste (%)
  - CO2 emissions (tonnes/yr)
  - Plastic waste (tonnes/yr)

- **Social**
  - Supplier waste (%)
  - Customer waste (%)
  - CO2 emissions (tonnes/yr)
  - Plastic waste (tonnes/yr)

**Ocado Salad Waste Measurement Tool**

**Ocado**

**Wrap**

**Max. Life**

**Min. Life**

**Lead-time**

**T. Purge**

**% Purge**

**Availability**
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Prepared by Cardiff University and Ocado in collaboration with WRAP UK
Towards Ocado salad supply chain zero waste strategy

THANK YOU