



Measuring and managing retail food waste

REFRESH Community of Experts webinar series

www.refreshcoe.eu

5/7/2019



REFRESH is funded by the Horizon 2020 Framework Programme of the European Union under Grant Agreement no. 641933. The contents of this document are the sole responsibility of REFRESH and can in no way be taken to reflect the views of the European Union





Background

REFRESH:

- EU research project taking action against food waste
- Actively promotes collaboration in tackling food waste

REFRESH Community of Experts (CoE) is virtual platform to:

- Share knowledge and best practice
- Enable replication
- Host tools and resources
- Promote cross-sector collaboration



The food resources being lost and wasted in Europe would be enough to feed all the hungry people in the world two times over (European Commission 2015).



88 million
tonnes of food
waste a year
produced by EU-28



€143 billion
estimated financial
loss a year



70%
EU food waste
arises at household,
foodservices &
retail sector



47 million
tonnes food waste
contributed by
household section
alone



Background

Popular Resources



Policy framework

Courtauld Commitment 2025

Chase Ford

Courtauld 2025 is a voluntary agreement that brings together organisations from across the food

13 Comments Share

Costing dimensions of food

Food Loss and Waste Protocols

Dave Jones

The Food Loss and Waste Accounting and reporting standard is a global standard that provides

11 Comments Share



Waste prevention

Framework for Action - Spain proposal

Liam Preston

Spanish Refresh signatories commit to a nonbinding agreement to contribute to the reduction of food

16 Comments Share



Policy Framework

Think.Eat.Save Guidance by UNEP

Grace Louw

Use the Think.Eat.Save tool to receive clear and comprehensive guidance on scoping, planning and

4 Comments Share

Waste prevention

Champions 12.3 Business case for reducing food waste

Kevin Smith

Champions 12.3 encourages businesses leaders to act on food waste to make a real change. The



Costing Dimensions of Food

EU Fusions Food Waste Quantification Manual

Abby Brie

The EU Food Waste Quantification Manual sets out a series of initiatives to reduce food waste

Waste prevention

Best Practice Assessment Consumer Level Food Waste

Jennifer Laren

Food waste quantification is challenging, but two recently published sets of guidelines will help

Waste prevention

Common Qualitative Research Protocol

Joe Sommers

Common qualitative research protocol for application in other countries as part of the Community



Background



Sign In

Username

Password

Sign In

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Not a member yet?

Join us and help us to build a growing community striving to reduce food waste.

In addition to accessing our library of resources, registering as a member includes the following benefits:

Benefits of becoming a member

- ✓ Access to library of resources.
- ✓ Support from other members.
- ✓ Ability to upload and share resources and comments.
- ✓ Ability to comments on resources.

Request to Join



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Nora Brüggemann

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Start sharing your knowledge! **Share a resource**

My Past Contributions

Below is a list of previously uploaded resources added by you. You can click to edit the resources.

Inventory of Business Change Tools	09/05/ 2017
Causes & Determinants of Consumers Food Waste	13/02/2017
Socio-Economic Implications of Food Waste, Economics of Innovation	09/11/2016



The webinar series

REFRESH CoE running webinar series, 9 April – 2 May 2019.

Adding value to food waste and by-products	9 April 2019
Voluntary agreements to address food waste	10 April 2019
Tackling consumer food waste	29 April 2019
Measuring and managing retail food waste	2 May 2019

To view recordings please visit:

www.refreshcoe.eu



Our speakers today



Dr Julian Parfitt,
Technical Director,
Anthesis Group



Drs. Ing. Joost Snels,
Senior researcher
supply chain
development,
Wageningen Food &
Biobased Research



Tecla Castella, UK
Head of Data
Analytics, Anthesis
Group

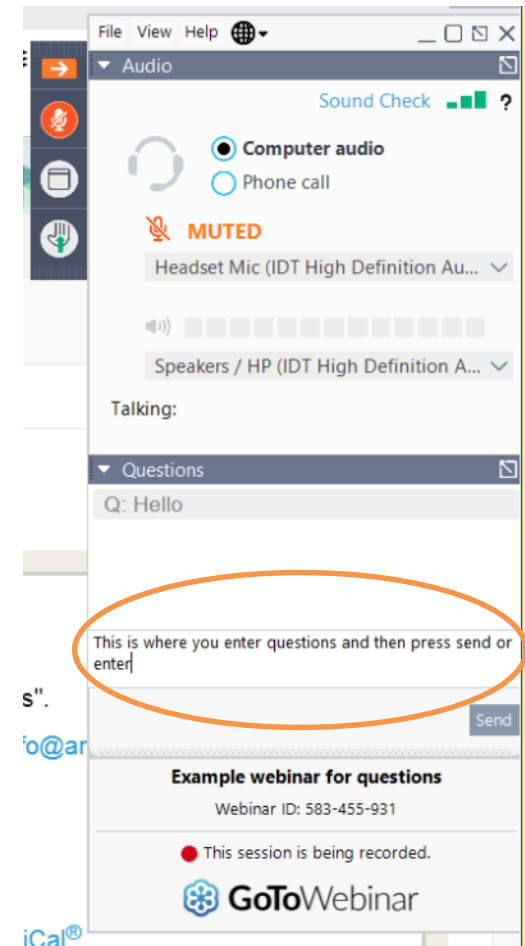


Agenda

- 1. Introduction and overview (Julian):** including the scale of issue and the policy landscape
- 2. Measurement (Joost):** including an introduction to 'Quick Scan Monitor'
- 3. Case study (Tecla):** including lessons learned from a retailer in Central Europe
- 4. Questions**
- 5. Close**

Asking questions

- Please ask questions!
- Use the question box near the bottom of your control panel
- We will try and answer as many as we can at the end of the webinar
- CoE can also be used to ask questions and share knowledge





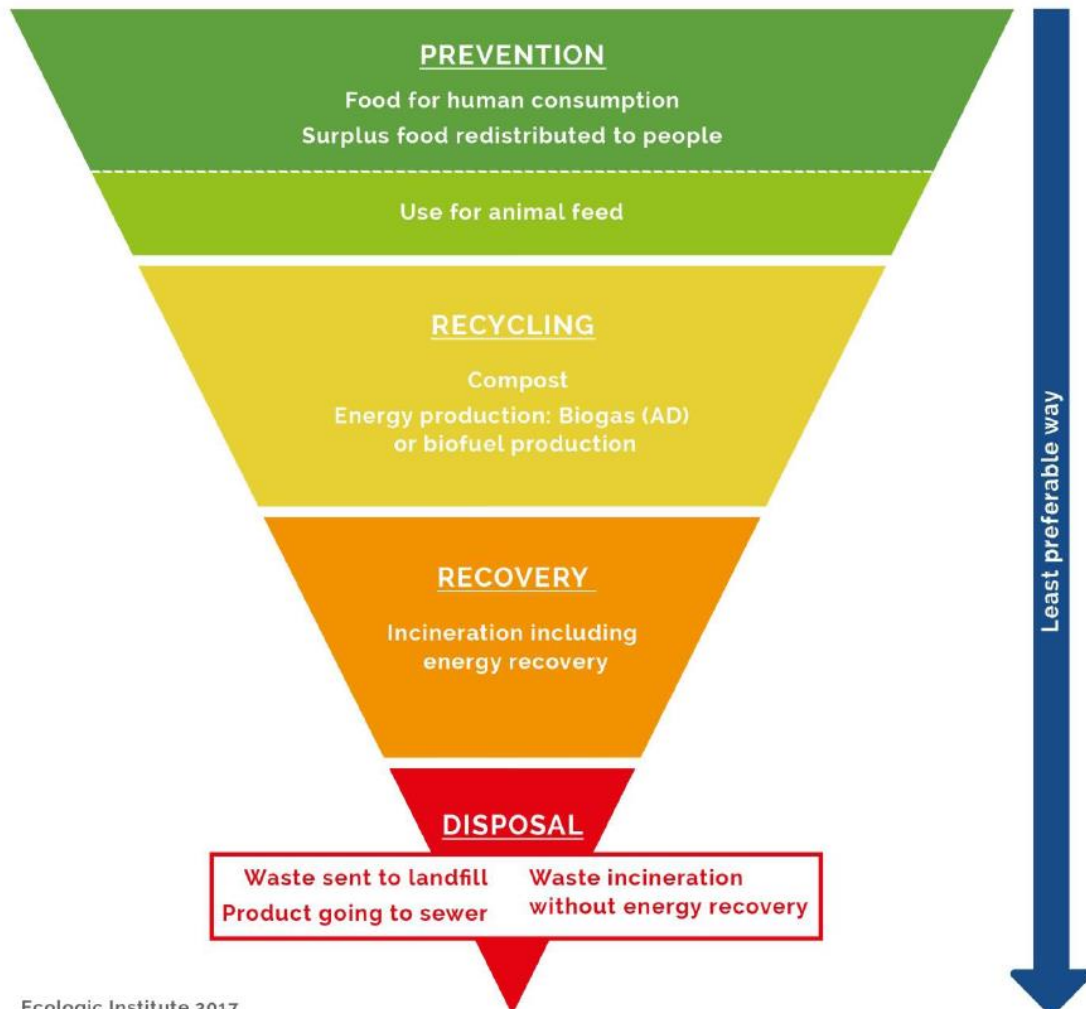
Dr Julian Parfitt, Technical Director, Anthesis Group

Introduction and overview



Waste and Resource Policy

FOOD UTILIZATION HIERARCHY



SDG 12.3
'Keep food as food'

Many now signed up to 2030 target

Key priority of Europe's Circular Economy Package

The European food waste mountain

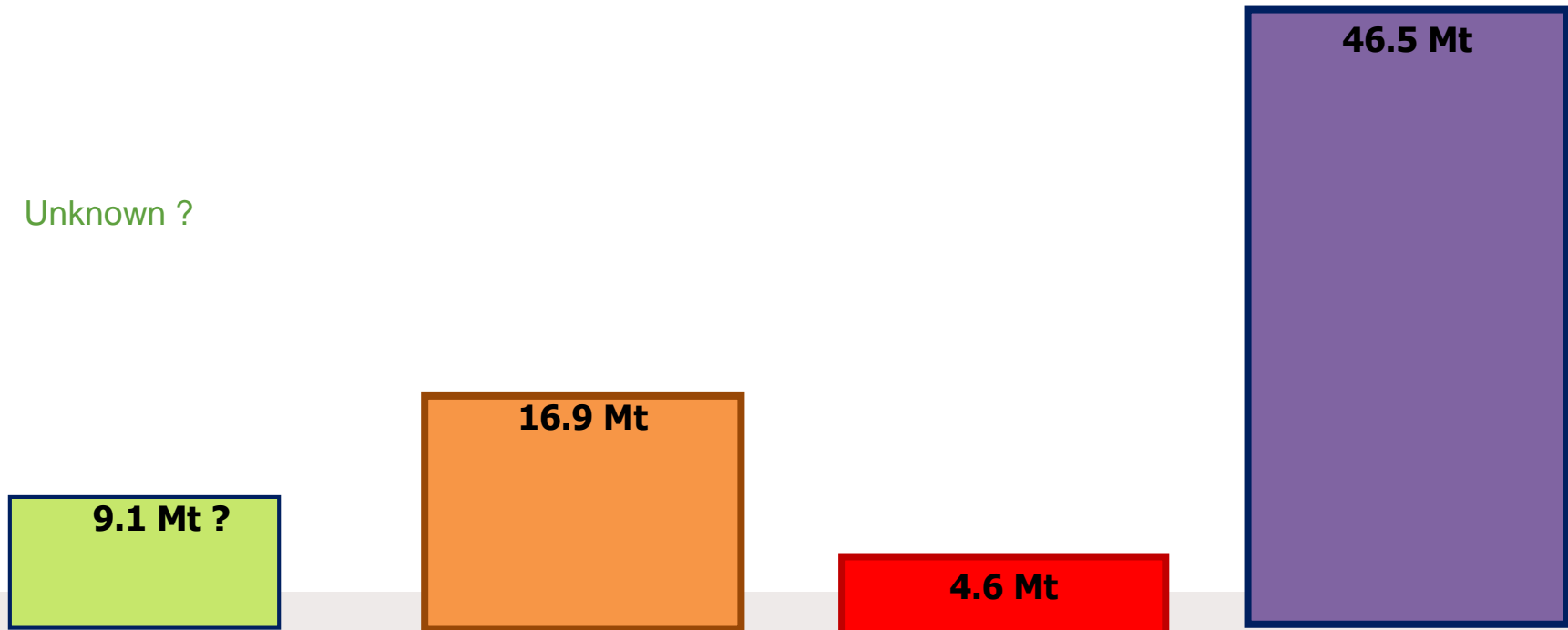
EU food waste estimate = 88 million tonnes

[source: FUSIONS 2012, including inedible parts]



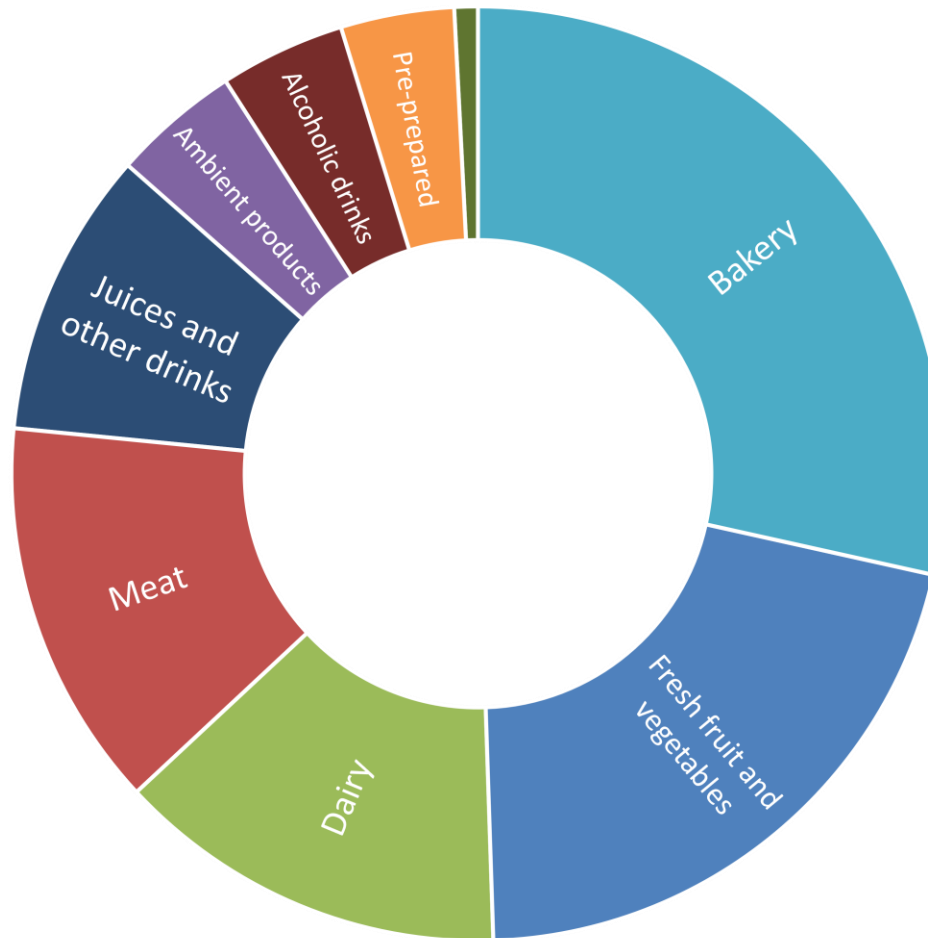
[Food service = 10.5Mt : 12%]

Unknown ?



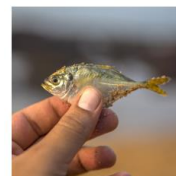
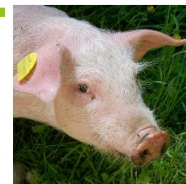


Likely composition of EU 28 retail stage food waste (DG Sante/ Anthesis 2018)



Refrsh - policy areas analysed

1. Waste and resources policy
2. Food safety and hygiene
3. Use of former food in animal feed
4. Agriculture & rural development
5. Fisheries policy
6. Unfair trading practices
7. Bioenergy
8. Product info & date labelling
9. Changing consumer behaviour
10. Voluntary cooperation



Classification of different types of food waste drivers within supply chain

HR & system policies within the direct control & influence of business

Technology failures/ poor design

External market & regulatory factors divert surplus to waste

Supply chain induced factors

- Lack of strong feedback loops between food procurement/ forecasting and food waste in store
- Information failures: granular/ transparent food waste reporting
- Staff training: food handling to reduce breakages in store and depot
- SOP's for back of store redistribution systems
- Store stocking and 'availability' targets need reassessment (e.g. in relation to in-store bakery)

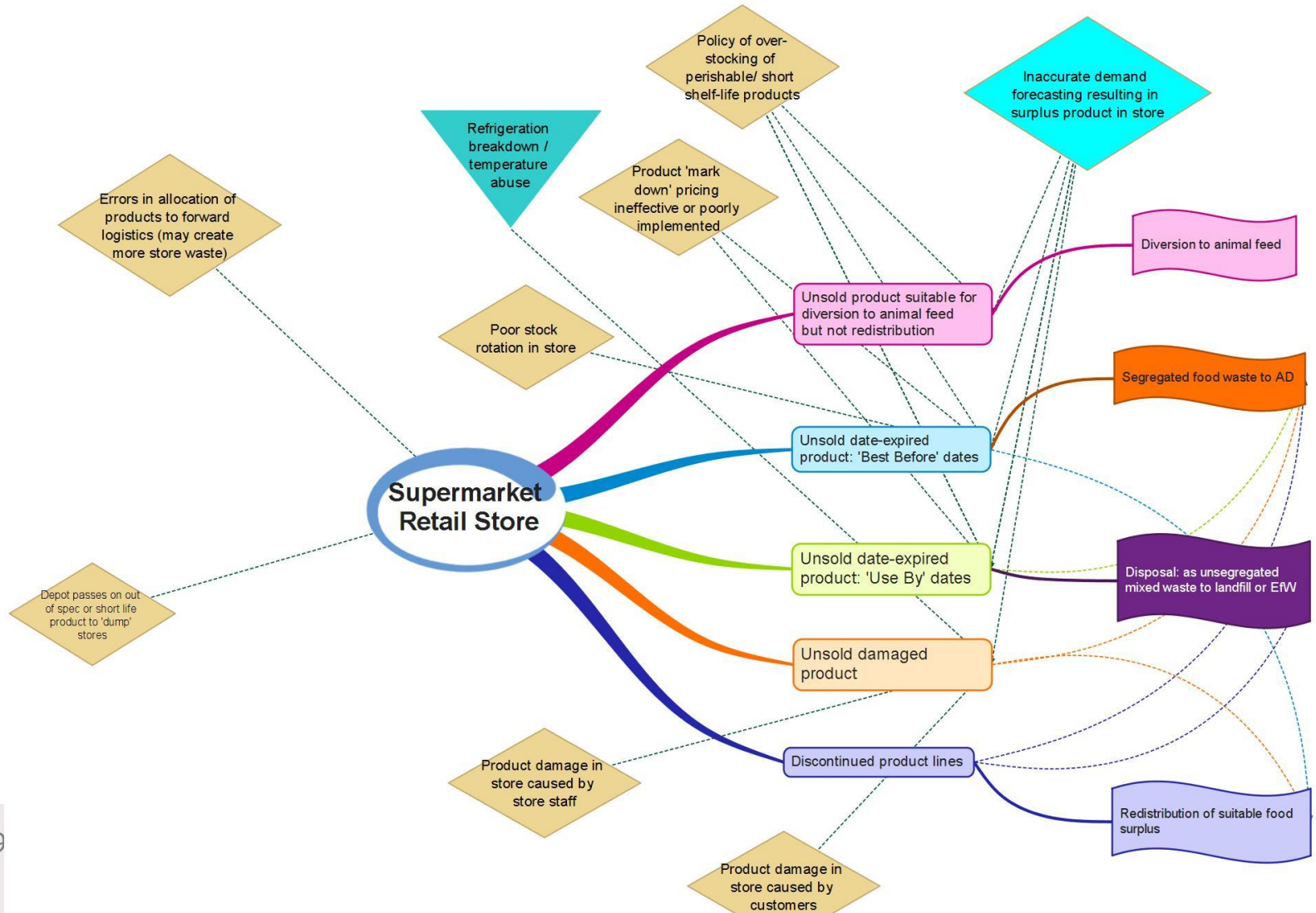
- Design improvements to primary and secondary packaging to reduce damage in store and depot
- Improvements/ investments in scanning systems to enable SKU-level food loss statistics at store
- Chill chain/ refrigeration failures

- Lack of incentives for redistribution of food surplus
- Inconsistent date marks and storage advice to consumers
- Product life too limited – as set by food businesses, retailer requirements and food safety competent authorities
- Legal risks deter bakery surplus unsuitable for redistribution going to animal feed

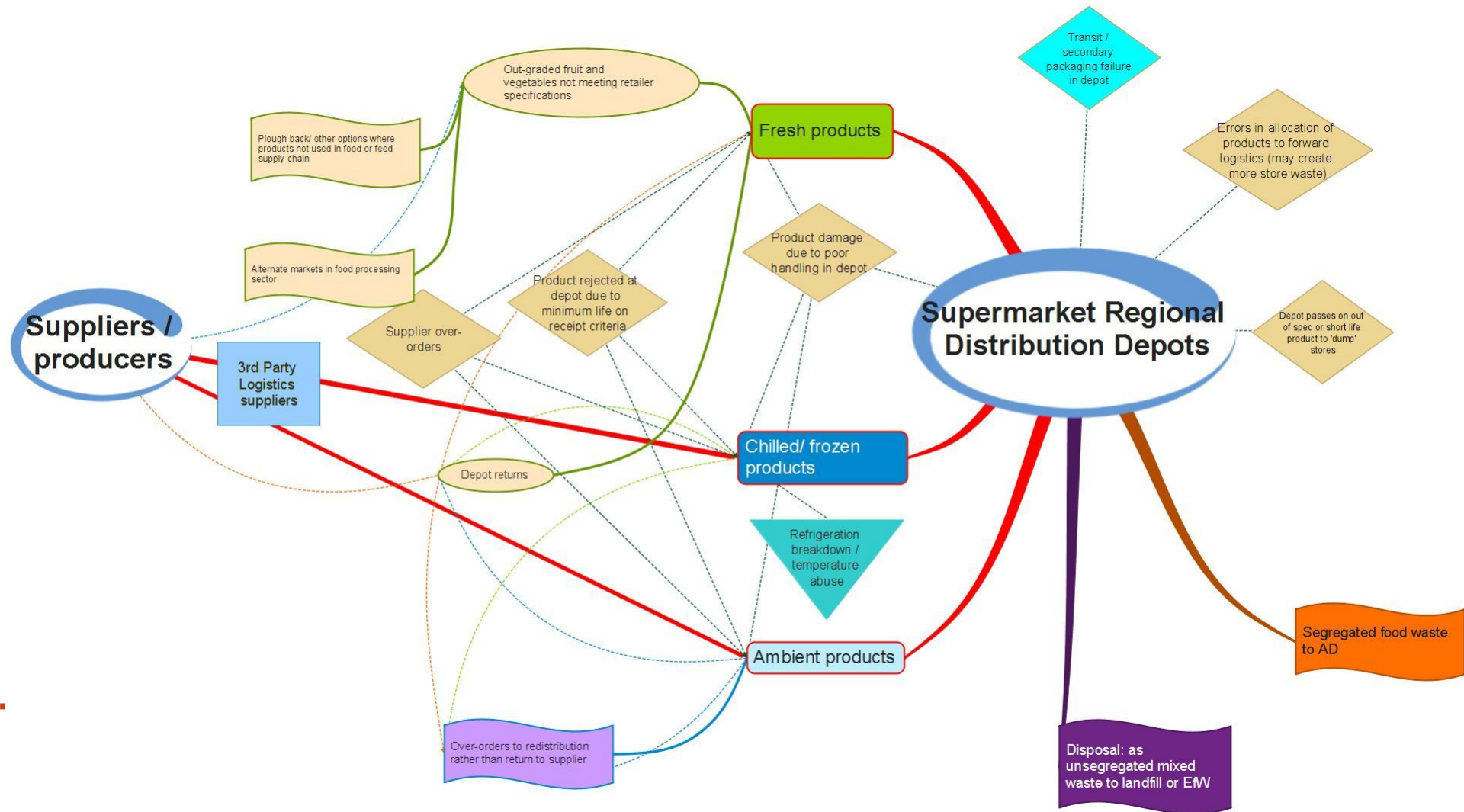
- Information exchange/ planning/ demand forecasting
- Market imbalances affecting interpretation of product quality/ specifications
- Choice of product qualities/ varieties to meet consumer/ retailer needs
- Unsold product returns policy creates waste at supplier stage



Retail food waste drivers – at store



Retail food waste drivers – supplier to depot



Retail stage – key policy priorities

- Transparency in food waste reporting/ measurement of food waste
- Strengthening feedback loops between ordering systems and food waste
- Better information sharing between retailers and suppliers to reduce supply chain losses
- Review of shelf-availability strategies in relation to food waste
- Better use of existing retailer data to identify hotspots and inform food waste prevention



MSc Joost Snels, Senior researcher supply chain development, Wageningen Food & Biobased Research

Measurement



What we learned:

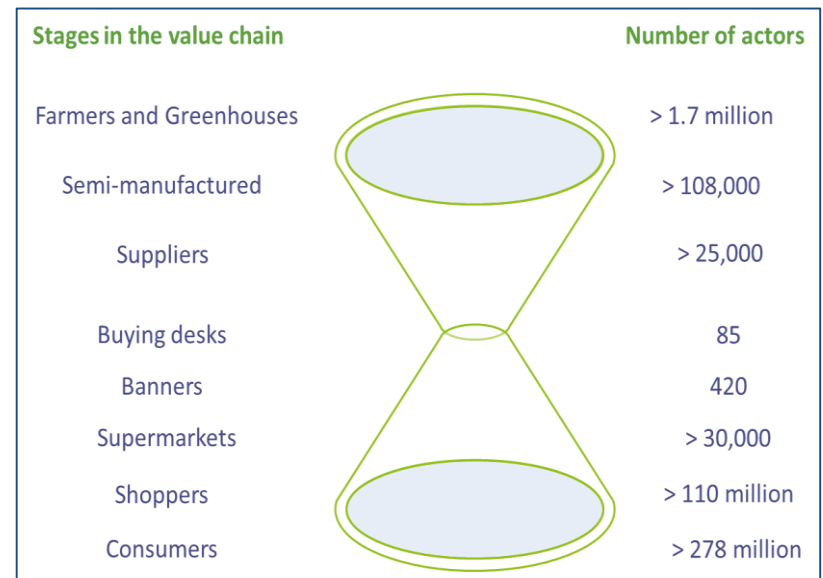
- In retail there is a lack of registration of waste data, and there is a need for defining the right control information
- Only after having implemented proper waste registration, and defining the right control information (data visualization, key performance indicators), the retailer will be able to set up an effective waste-monitoring and improvement program

"If you can't measure it, you can't improve it"

(Peter Drucker)

Why measurement on retail level?

- Retail/supermarkets fulfil a key centralizing function
- Through their purchasing/ordering policies, marketing, discount policies, service levels, etc. they influence both food consumption and food waste
- Retail can also affect food waste in other chain sectors

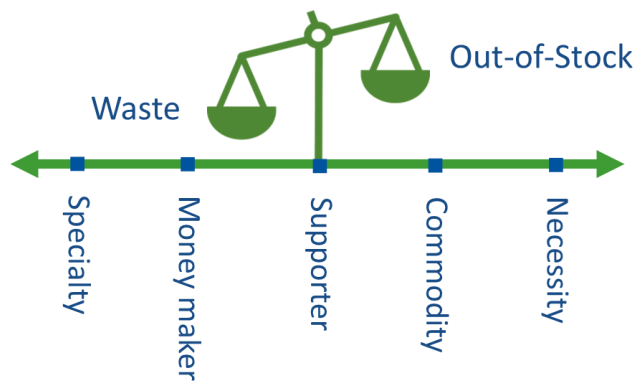


(Gereffi, 2012)

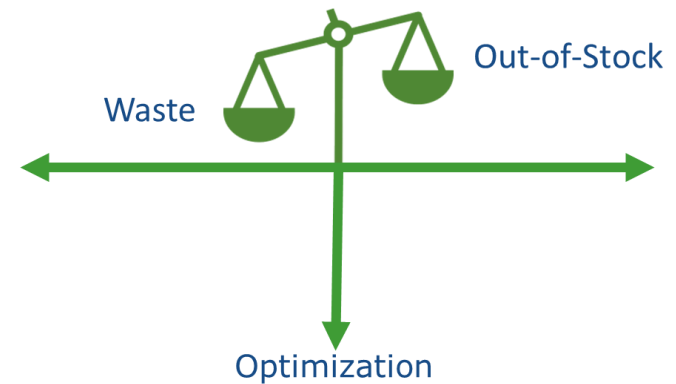


Daily challenge: out-of-stock vs. food waste

- Balance between out-of-stock and food waste
- Balance differs per product (category)

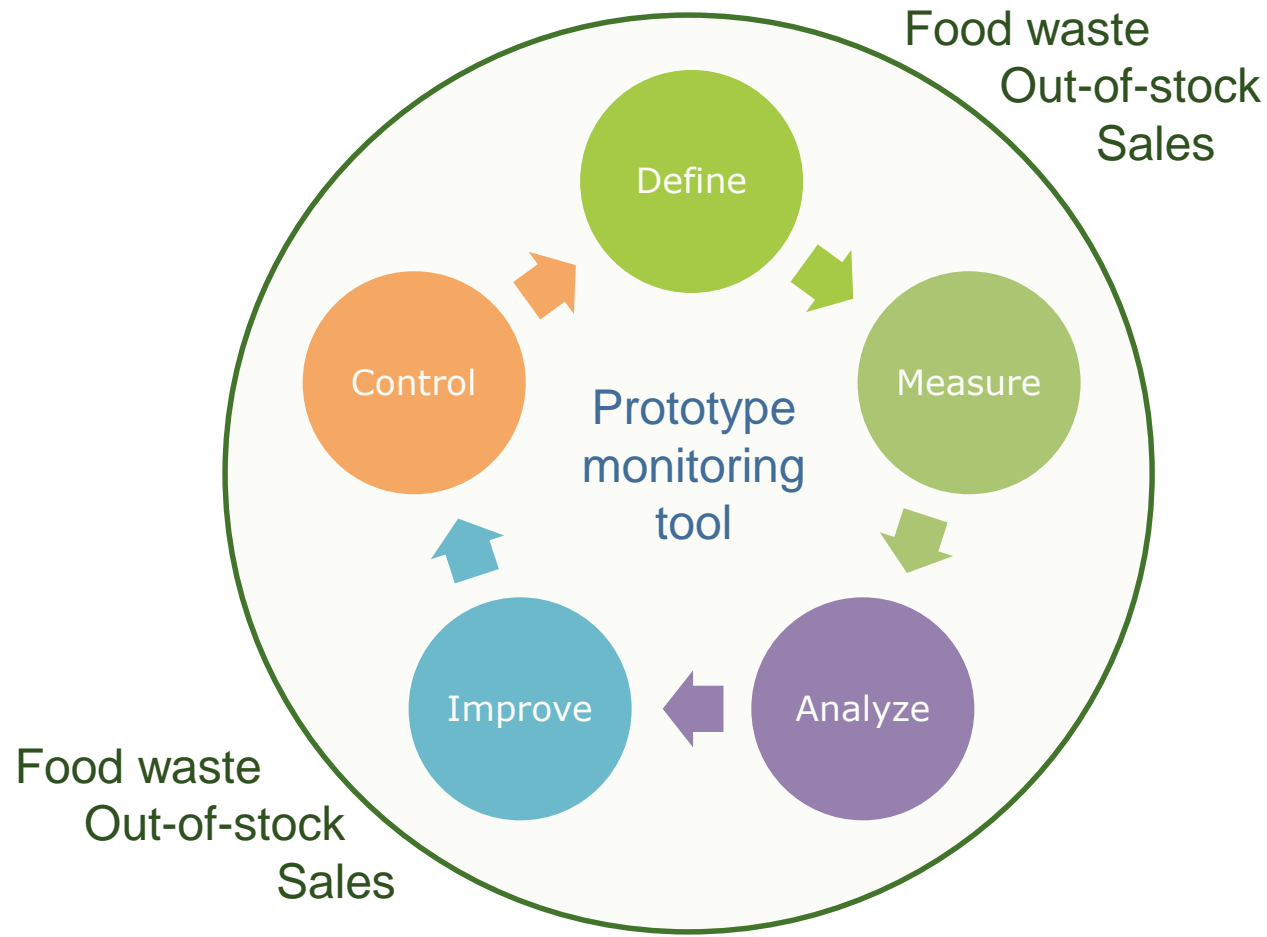


- What interventions can break free from the balance between out-of-stock and food waste?





Monitoring: the basic idea





Prototype monitoring tool

- 🥦 Food waste & out-of-stock at the supermarket-outlet level
- 🥦 In-store food waste: occurs after the store has accepted delivered products
 - 🥔 Expiration date labels
 - 🥔 Unacceptable quality decay
 - 🥔 Product/packaging damage



Using data that is available

- Weekly waste & out-of-stock data of each product-outlet combination
 - Sales (€)
 - Food waste (€)
 - Out-of-stock (% of opening time per week)
- Consumer price of each product (€)
- The shelf life of each product
- The minimum order quantity of each product
- The promotion weeks of each product
- *Weekly demand-uncertainty data of each product-outlet combination*
- Geographical data of each outlet



Home



REFRESH: Resource Efficient Food and dRink for the Entire Supply cHain

REFRESH is an EU research project taking action against food waste. 26 partners from 12 European countries and China work towards the project's goal to contribute towards Sustainable Development Goal 12.3 of halving per capita food waste at the retail and consumer level and reducing food losses along production and supply chains, reducing waste management costs, and maximizing the value from unavoidable food waste and packaging materials.



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Introduction

This prototype monitoring tool is dedicated to food waste occurring at the supermarket-outlet level. The prototype monitoring tool is about in-store food waste, which occurs after the store has accepted delivered products. In-store food waste occurs for different reasons. For example due to expiration date labels (expired best-before or use-by dates), unacceptable quality decay (quality as judged by sensory aspects such as visual appearance and odour) or product/packaging damage. Expired date labels are considered one of the main reasons for in-store food waste. Therefore, the prototype monitoring tool focusses on food products with an expiry date (e.g. fresh-cut vegetables and packed, fresh meat).

The monitor's level of detail is that food waste is registered at product-level and at a weekly level. Sales data and out-of-stock data are important contextual data.

The envisioned user of the prototype monitoring tool is someone at the retailer's head office who is interested in food waste at the retail outlets, e.g. a category manager or a sustainability manager.

This site makes use of the analytics service of company Matomo. We use this service to track the usage of this website. The data generated by this service are sent to the WUR. By clicking on the button 'Get Started' one does accept the tracking of this website, and that a cookie is placed for this tracking service.

The 'Get Started' button will open the prototype monitoring tool. The tool is 'self-explanatory', but if more explanation is required, the manual can be found [here](#).

Get Started



This prototype monitor has been designed as part of the REFRESH programme. While the authors of this prototype monitor have tried to make sure this prototype monitor is accurate, they cannot accept responsibility or be held legally responsible for any loss or damage arising out of or in connection with this information being inaccurate, incomplete or misleading.

Furthermore, the use of information generated with this prototype monitor is at the user's own risk. In using the information generated with this prototype monitor, the user remains fully responsible to comply with any applicable conditions, rules and regulations.

For any queries, comments and suggestions, please [contact us](#)

Comparing products: waste vs. sales

Comparing products

Home

Waste vs. Sales

Waste vs. Out-of-stock



Selected time period

201618

Selected time period

201717

Product

Product

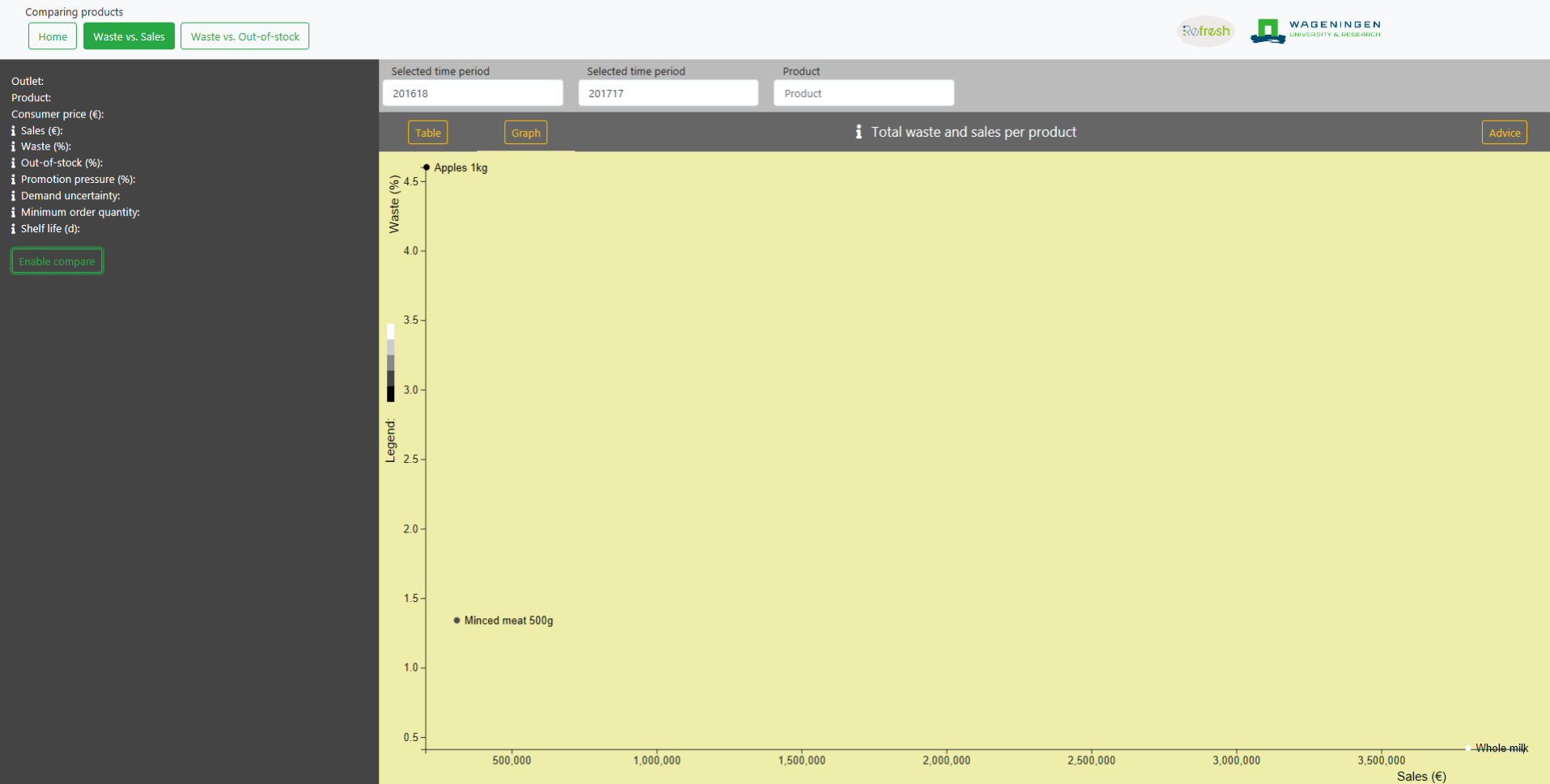
Table

Graph

Total waste and sales per product

Product	Waste (€)	Sales (€)	Waste (% of sales)	Out of stock (%)
Minced meat 500g	4170	311154	1.3	8.5
Apples 1kg	9509	206712	4.6	9.5
Whole milk 1 litre	16025	3799715	0.4	6.3

Comparing products: waste vs. sales



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www.refreshcoe.eu

joost.snels@wur.nl

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Comparing products: waste vs. OOS

Comparing products

Home

Waste vs. Sales

Waste vs. Out-of-stock



- Outlet:
- Product:
- Consumer price (€):
- 📄 Sales (€):
- 📄 Waste (%):
- 📄 Out-of-stock (%):
- 📄 Promotion pressure (%):
- 📄 Demand uncertainty:
- 📄 Minimum order quantity:
- 📄 Shelf life (d):

Selected time period

201618

Selected time period

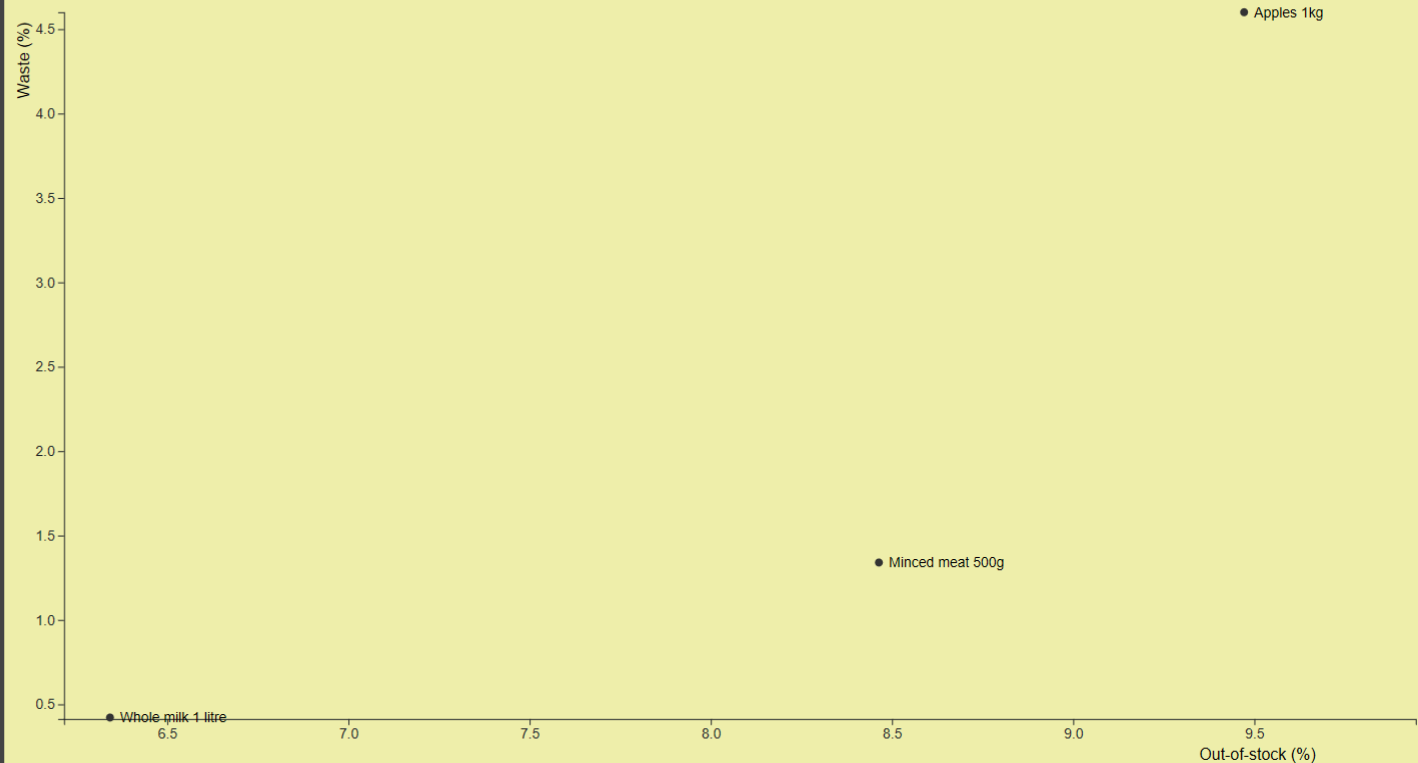
201717

Product

Product

📄 Total waste and average out-of-stock of each product

Advice



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Waste vs. out-of-stock: advice

Comparing products

Home

Waste vs. Sales

Waste vs. Out-of-stock



- Outlet:
- Product:
- Consumer price (€):
- ↓ Sales (€):
- ↓ Waste (%):
- ↓ Out-of-stock (%):
- ↓ Promotion pressure (%):
- ↓ Demand uncertainty:
- ↓ Minimum order quantity:
- ↓ Shelf life (d):

Selected time period

201618

Selected time period

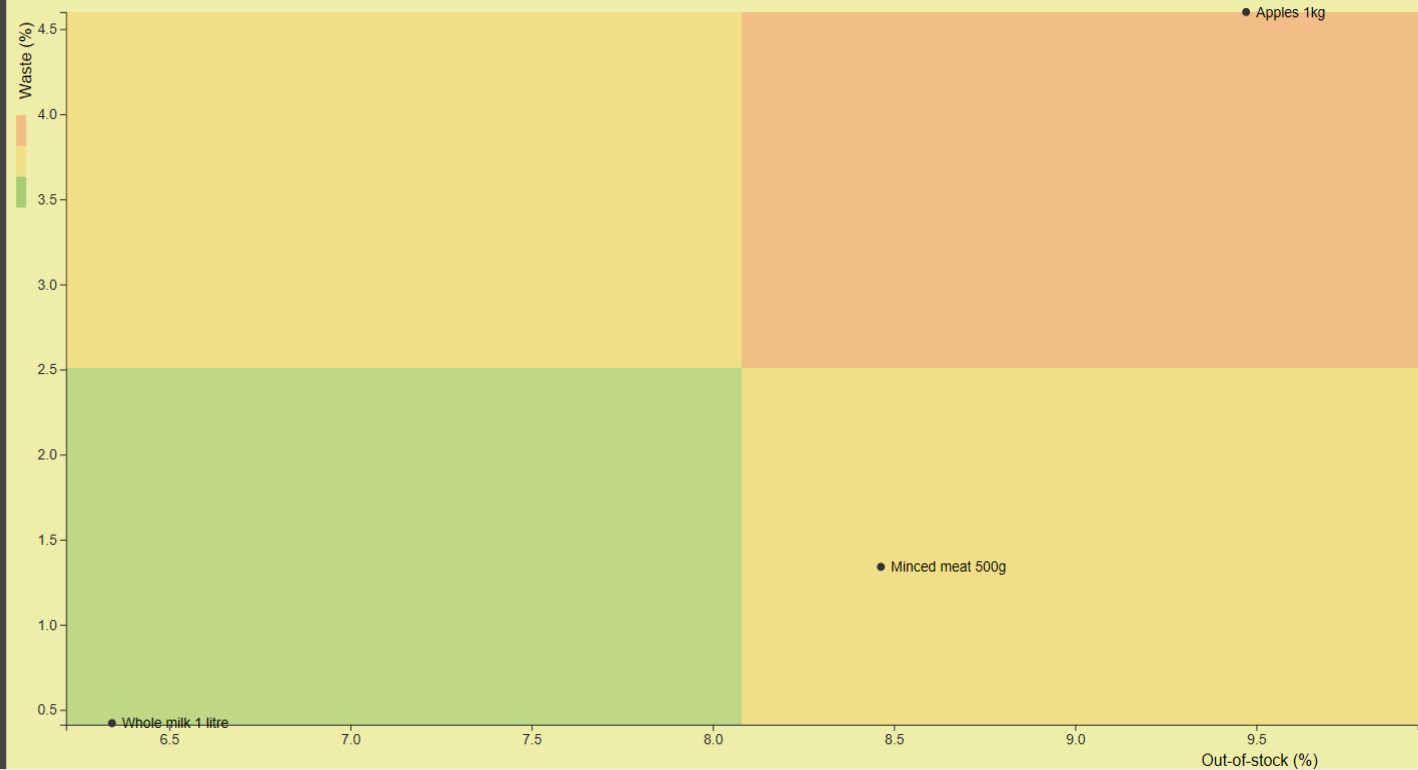
201717

Product

Product

Total waste and average out-of-stock of each product

Advice



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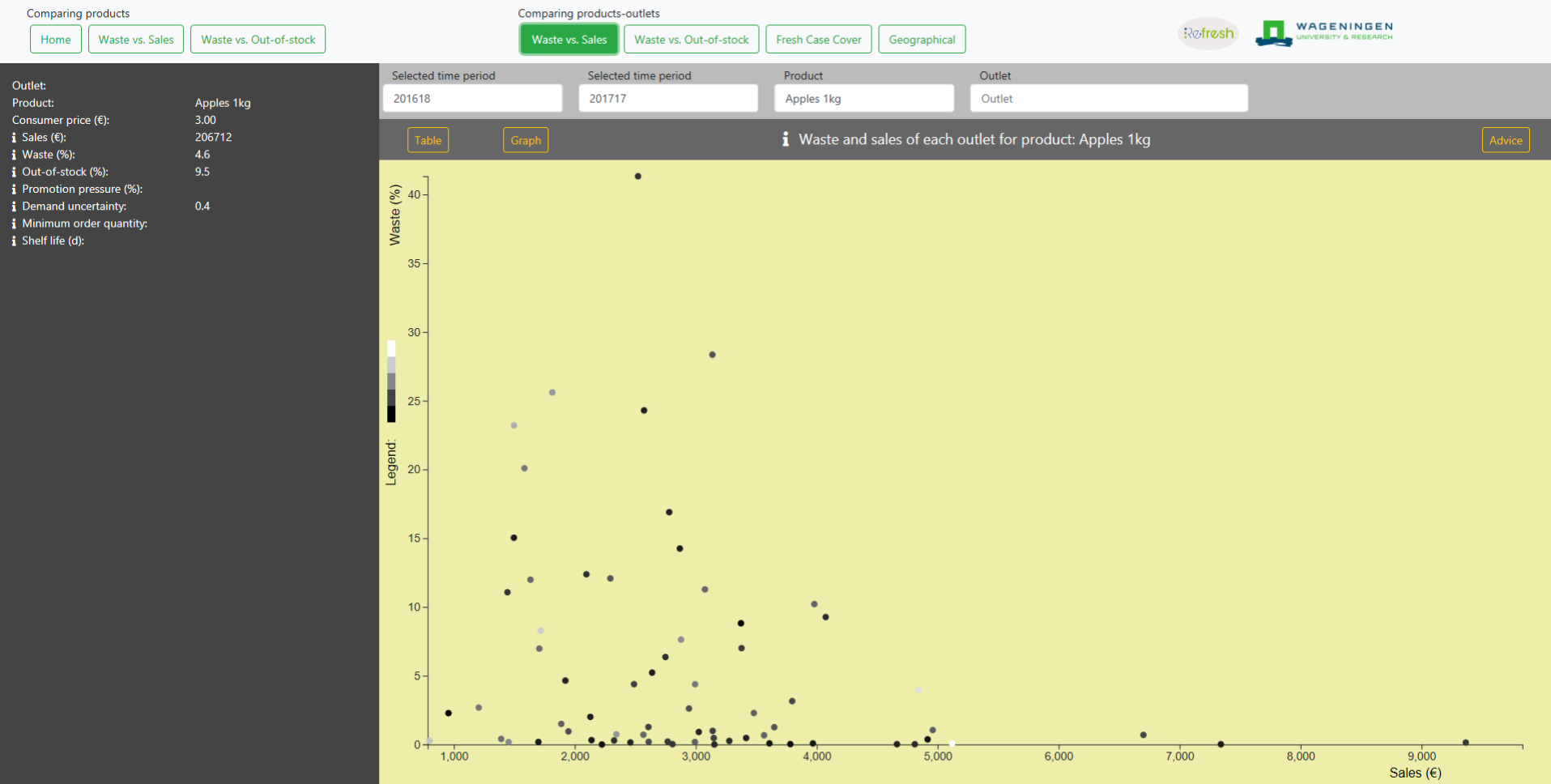
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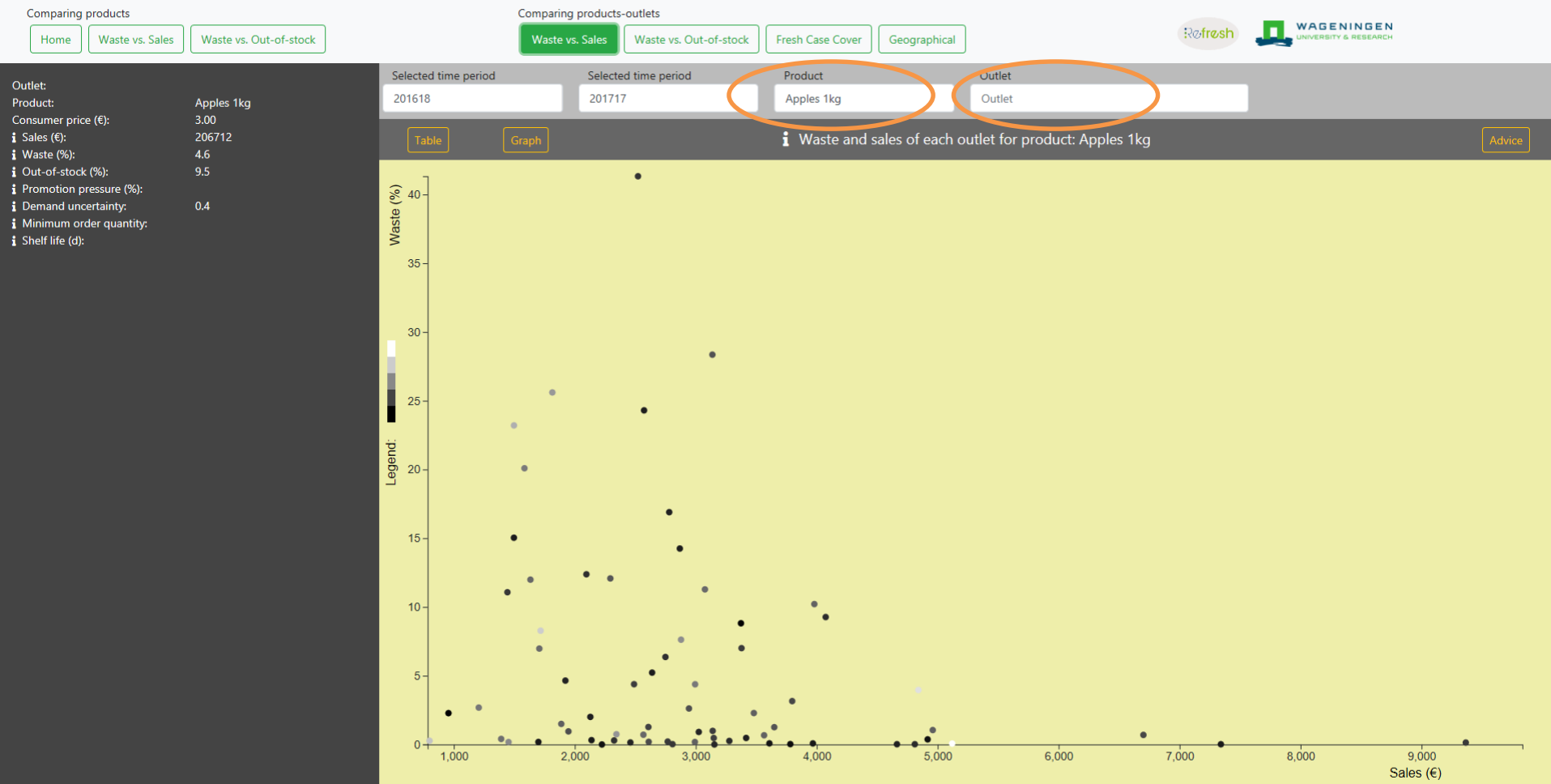
Waste vs. out-of-stock: advice

- Products within one of the two **green rectangles**: “Products with low out-of-stock and waste.” (*Milk*)
- Products within the **orange rectangle**: “Products with either high out-of-stock or high waste. Consider the exchange between out-of-stock and waste by adjusting the replenishment level.” (*Minced meat*)
- Products within the **red rectangle**: “Products with high out-of-stock and high waste. Analyze the replenishment policy or consider remediation.” (*Appels*)

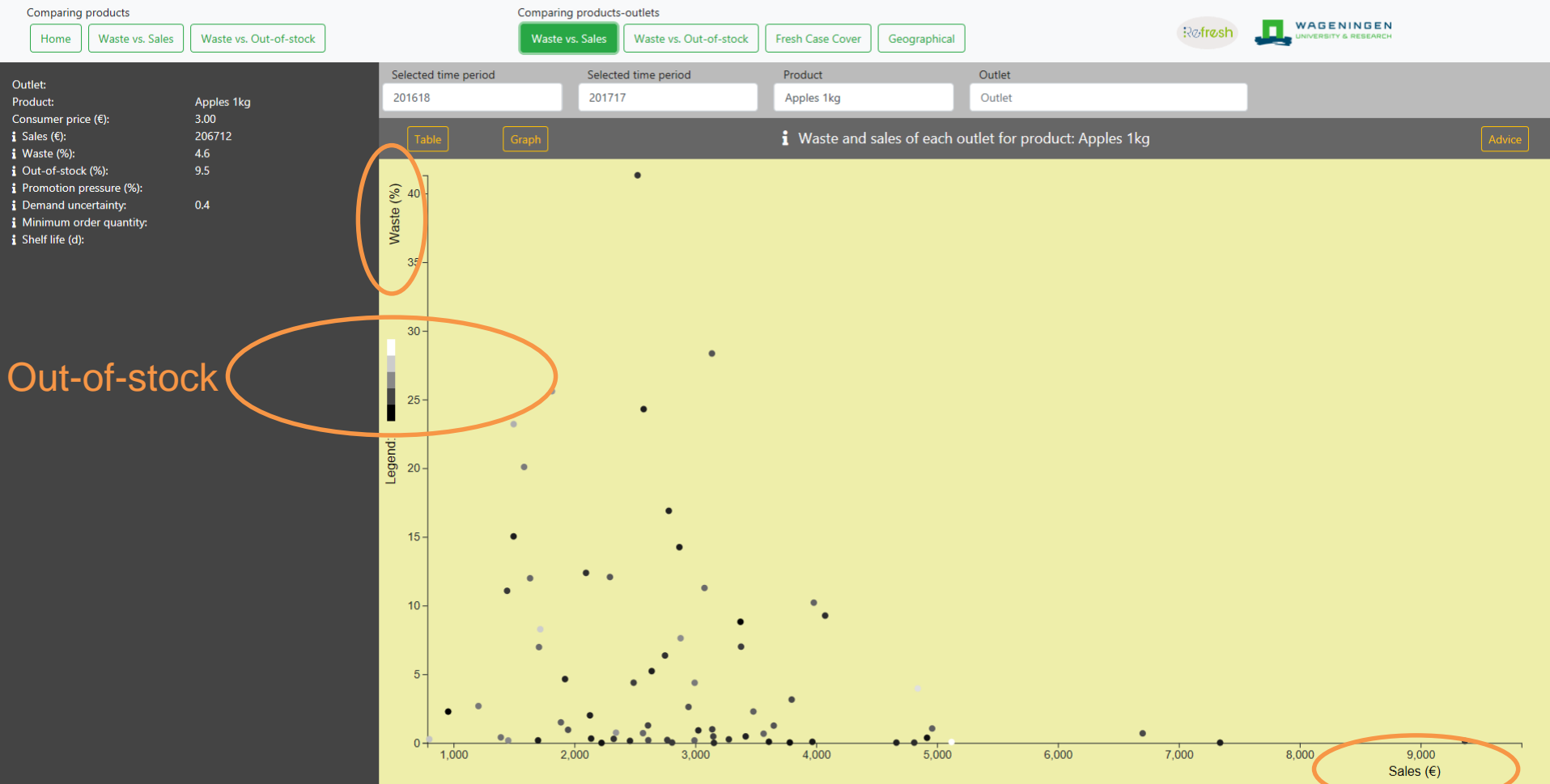
Comparing product-outlet combinations



Comparing product-outlet combinations



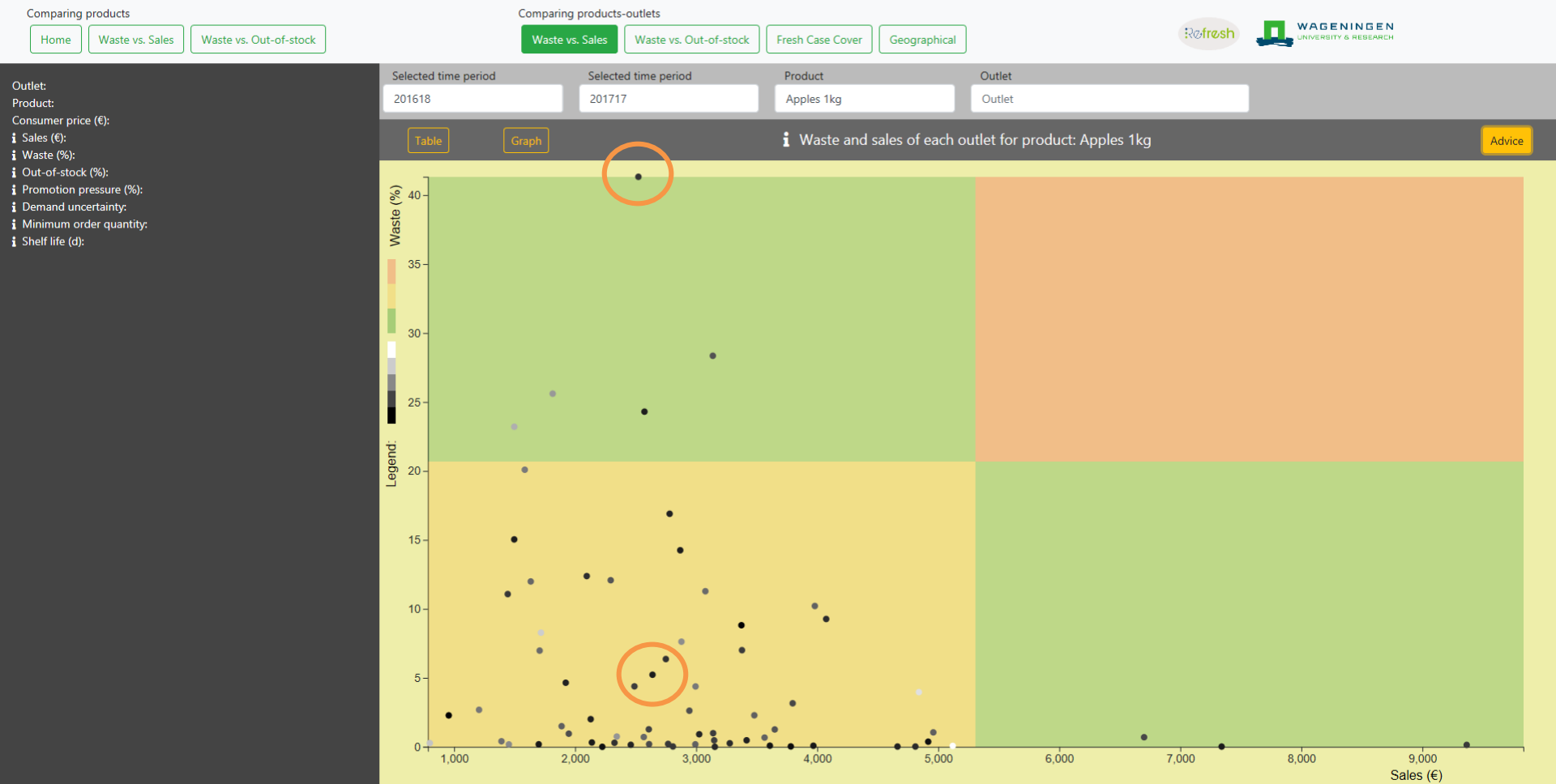
Sales, waste & out-of-stock



Outlet benchmark (sales vs. waste)



Product-outlet combinations: advice



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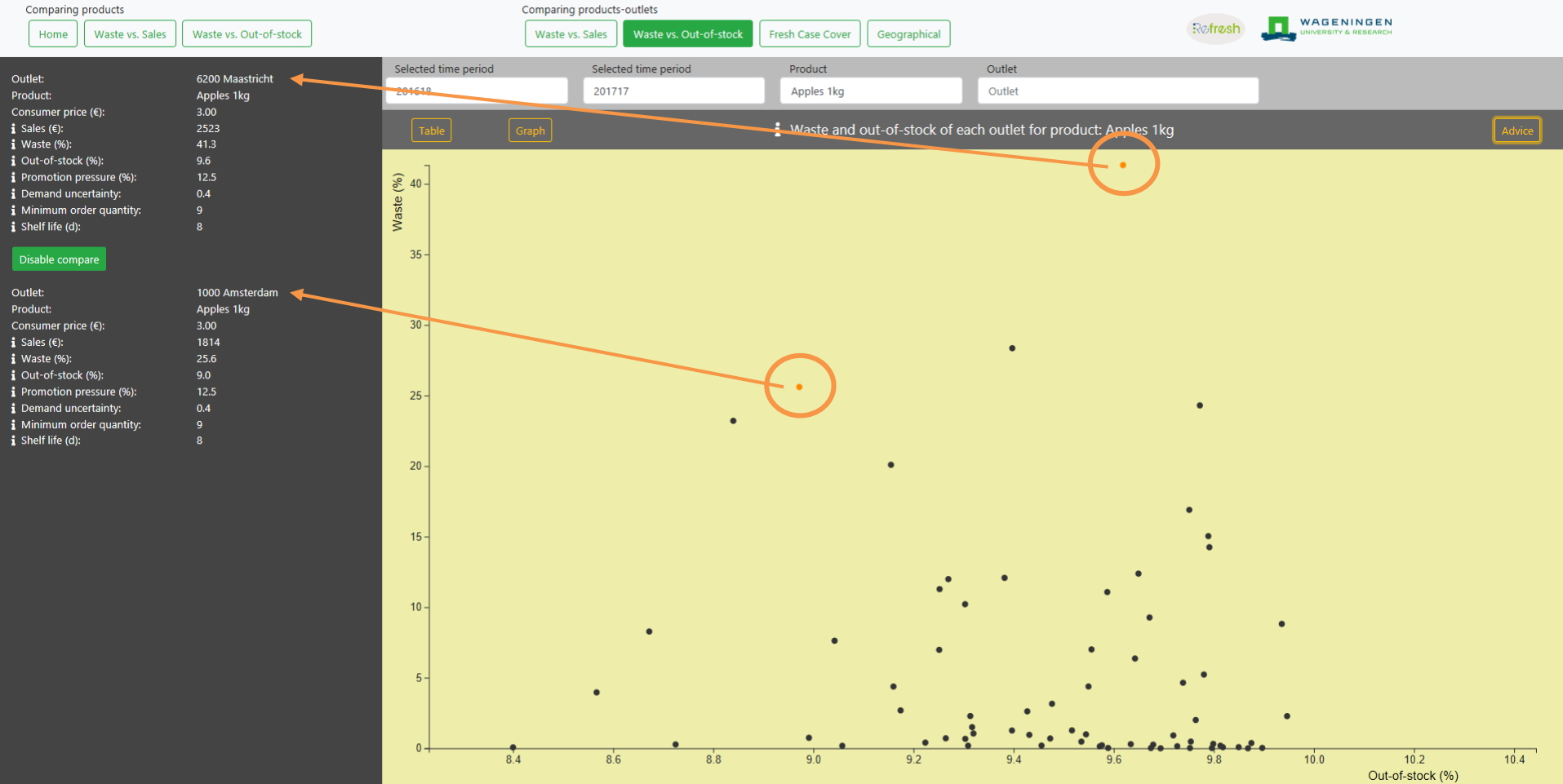
www.eu-refresh.org



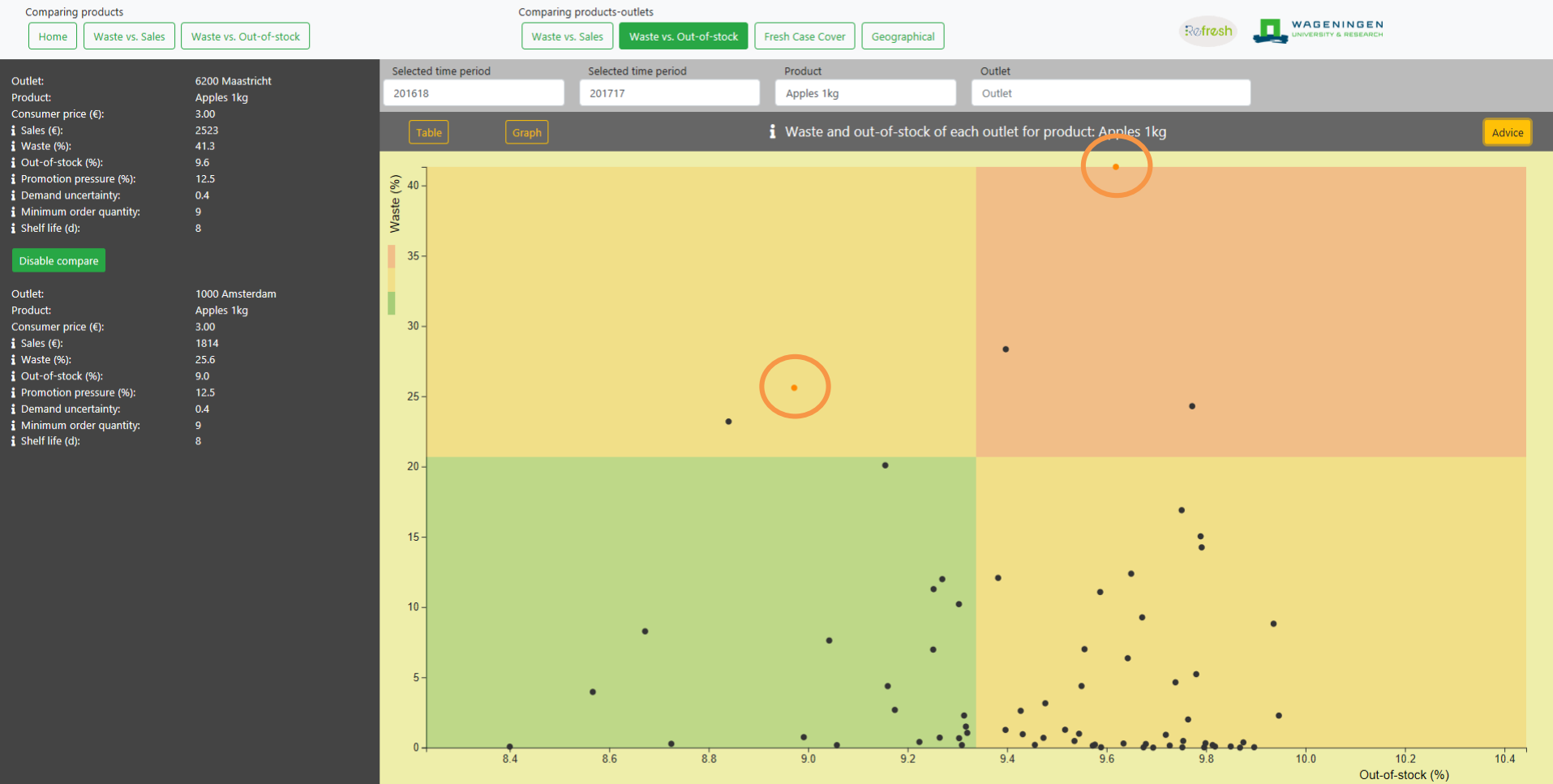
Product-outlet combinations: advice

- Outlets within one of the two **green rectangles**: “Outlets with waste percentages that fit with sales levels. However, waste differences between outlets may exist. Click on a specific outlet for further analysis.”
- Outlets within the **orange rectangle**: “Outlets with small to moderate sales. Waste percentage is lower than might be expected. Check out-of-stock. Click on specific product for further analysis”
- Outlets within the **red rectangle**: “Outlets with large sales, but with a large waste percentage as well. Give high priority to waste reduction. Click on a specific outlet for further analysis”

Outlet benchmark (OOS vs. waste)



Product-outlet combinations: advice

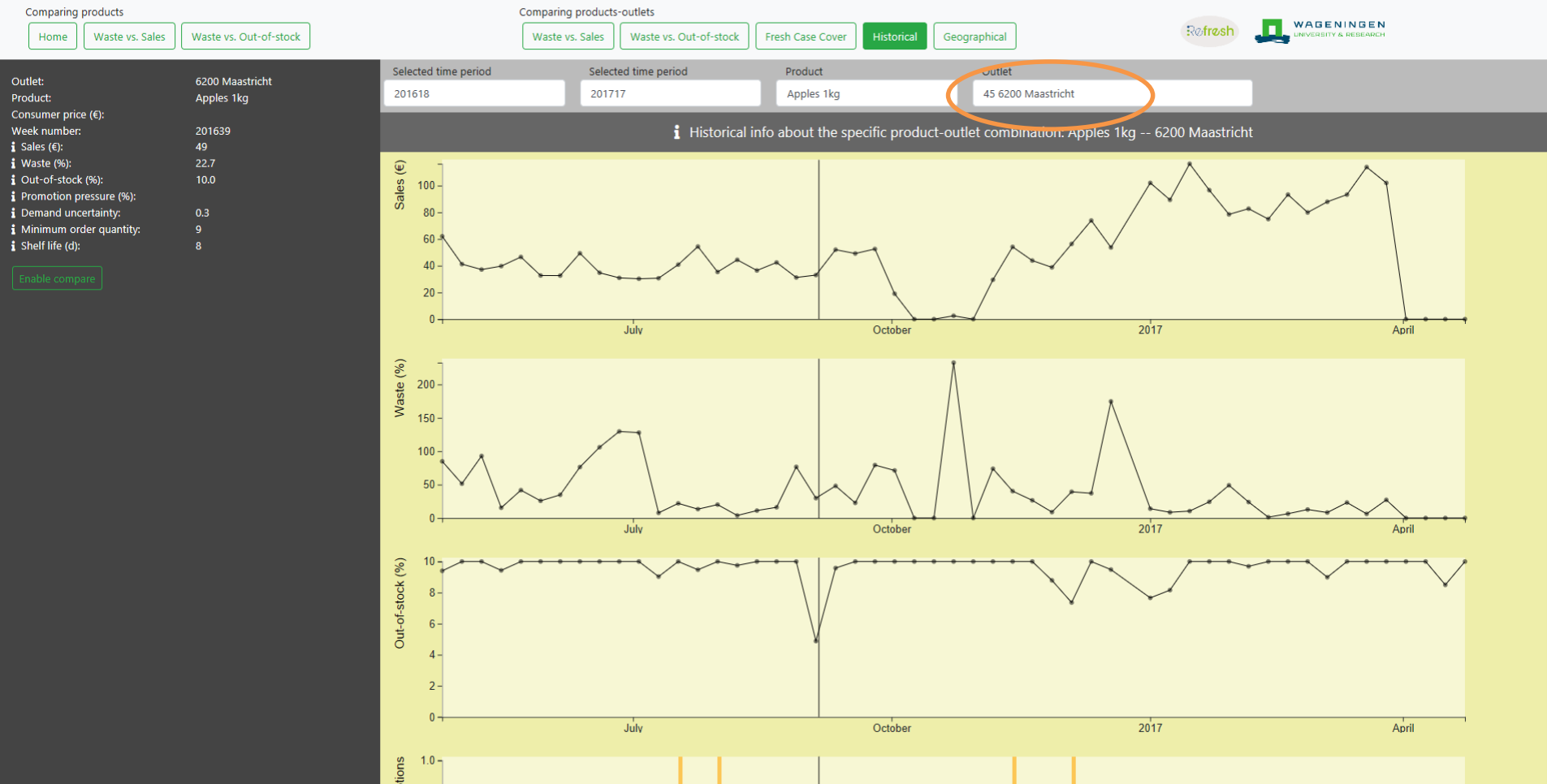




Product-outlet combinations: advice

- Product-Outlet combination within one of the two **green rectangles**: “Product-Outlet with low out-of-stock and waste.”
- Product-Outlet combination within the **orange rectangle**: “Product-Outlet combination with either high out-of-stock or high waste. Consider the exchange between out-of-stock and waste by adjusting the replenishment level.” (*Amsterdam*)
- Product-Outlet combination within the **red rectangle**: “Product-Outlet combination with high out-of-stock and high waste. Analyze the replenishment policy or consider remediation.” (*Maastricht*)

One outlet (detail)





Fresh Case Cover (Broekmeulen & van Donselaar, 2017)

- The Fresh Case Cover (FCC) is defined as the minimum order quantity divided by the average demand during the shelf life.
- $$\text{Fresh Case Cover (FCC)} = \frac{\text{Minimum order quantity}}{\text{Average demand during shelf life}}$$
- A FCC value above 1 means that on average the minimum order quantity is too large compared to the product's shelf life and the product's daily turnover, with waste as a consequence.
- A FCC value below 1 might still generate waste, because of turnover variability.



Tecla Castella, UK Head of Data Analytics, Anthesis Group

Central Europe – retail reporting case study



About Tesco

- Present in 11 countries
- £51 billion group sales
- Over 500k employees

Actions

- 1** No food that is safe for human consumption will be wasted inside the UK operations by 2017
- 2** Halve food waste in our own operations by 2030
- 3** Work in partnership with our suppliers to halve food waste in our supply chains by 2030
- 4** Help halve global household food waste in the markets where we have retail operations by 2030



About Tesco Central Europe

- Nearly 1,000 stores across Czech Republic, Hungary, Poland and Slovakia
- First retailer in Central Europe to publish food waste figures in 2017

Ambitions:

- By 2020 all our stores in Central Europe will offer surplus food to those in need
- One day no food that is safe for human consumption will go to waste

2017/18 sales tonnage vs surplus tonnage
(Not to scale)



Total food surplus
51,579 tonnes



SDG 12.3 and Champions 12.3

TARGET 12.3

By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses

CHAMPIONS  12.3



GUIDANCE ON INTERPRETING
SUSTAINABLE DEVELOPMENT GOAL TARGET 12.3

12 RESPONSIBLE
CONSUMPTION
AND PRODUCTION



Tesco Suppliers





Measuring Retail Food Waste

There are two methods for measuring retail food waste:

1. Waste contractor record – Top down method



- Based on reported tonnage collection
- Compositional analysis required for mixed waste streams



More easily available



Provides no granularity; waste audits subject to sampling error

2. Product scanning – Bottom up method

- Based on scanning waste products and combining with standard product weight



High level of granularity

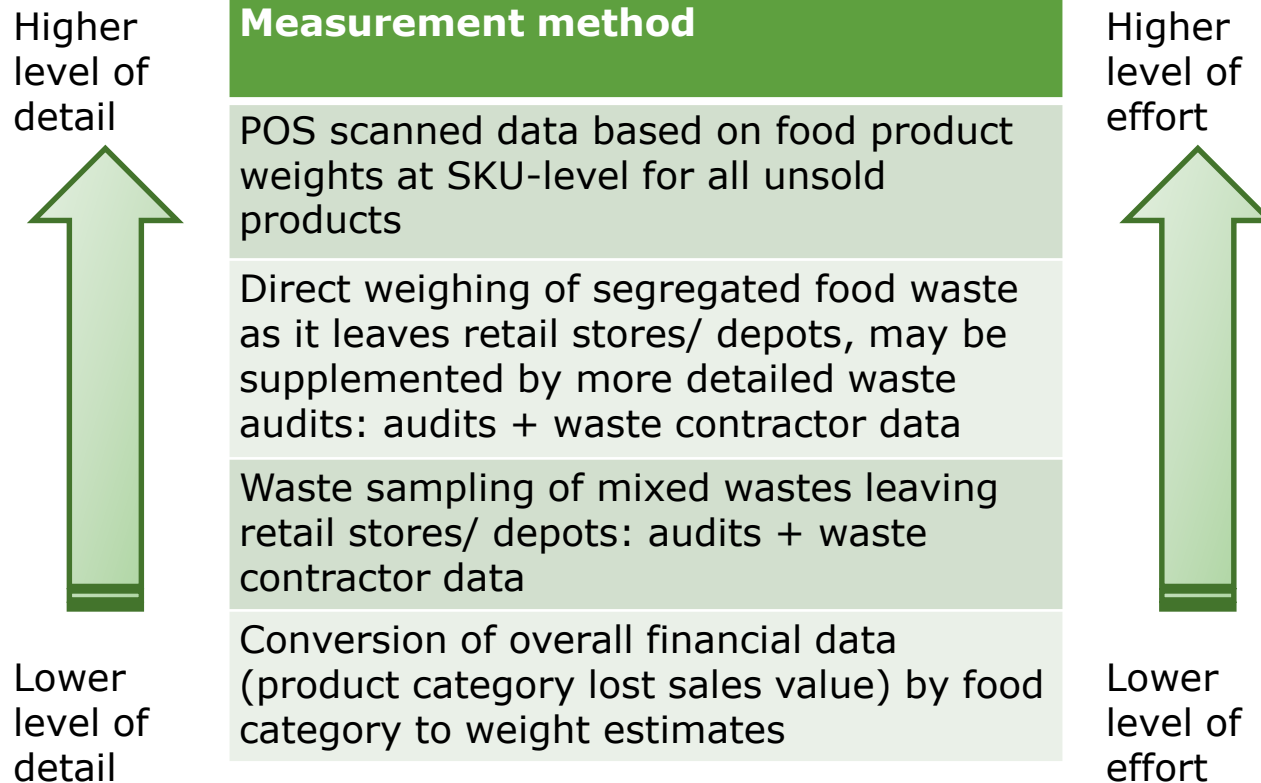


Necessary systems may not be in place or work needed to get different datasets to relate

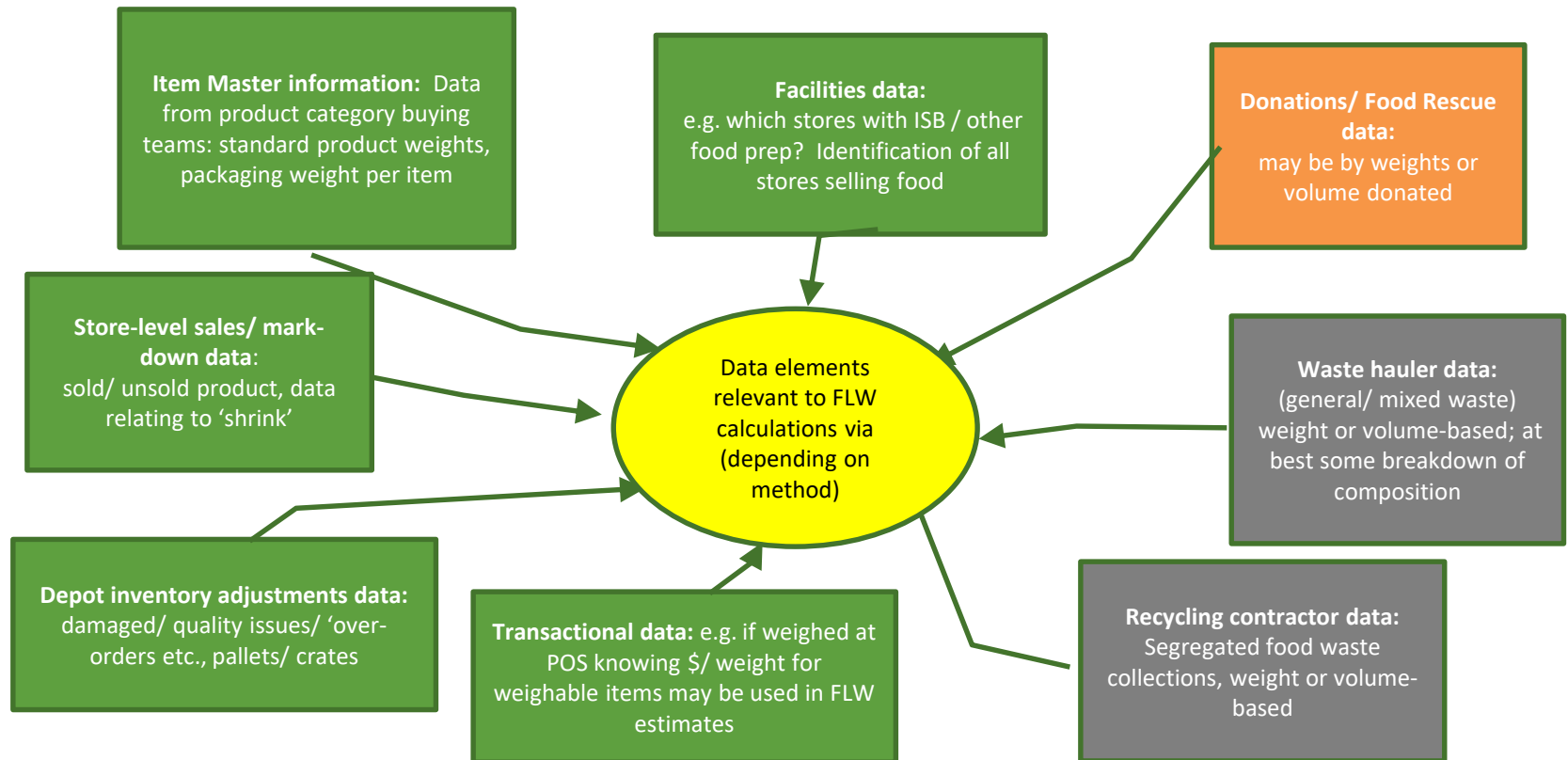




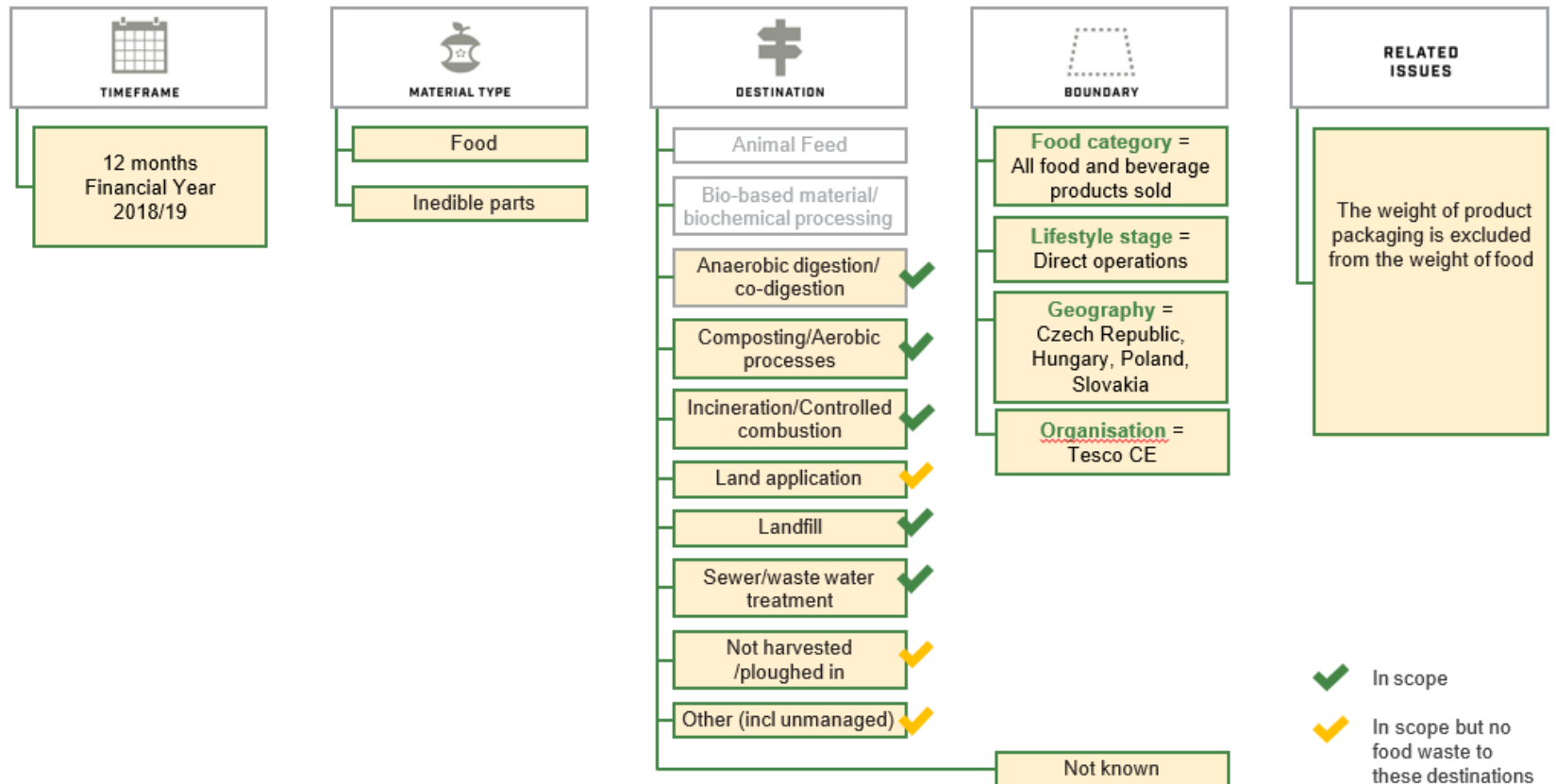
Evaluation of Options



Understand who has the data

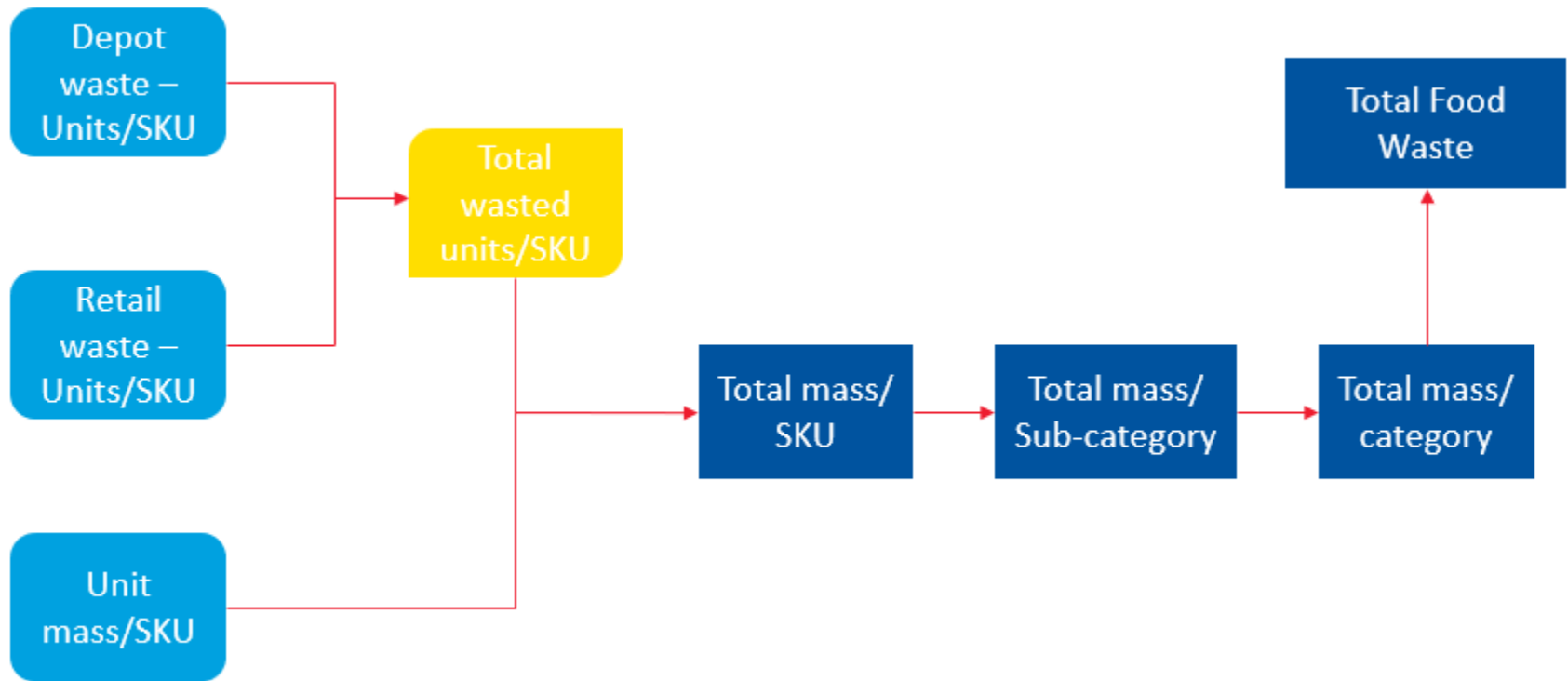


Scope of Calculation



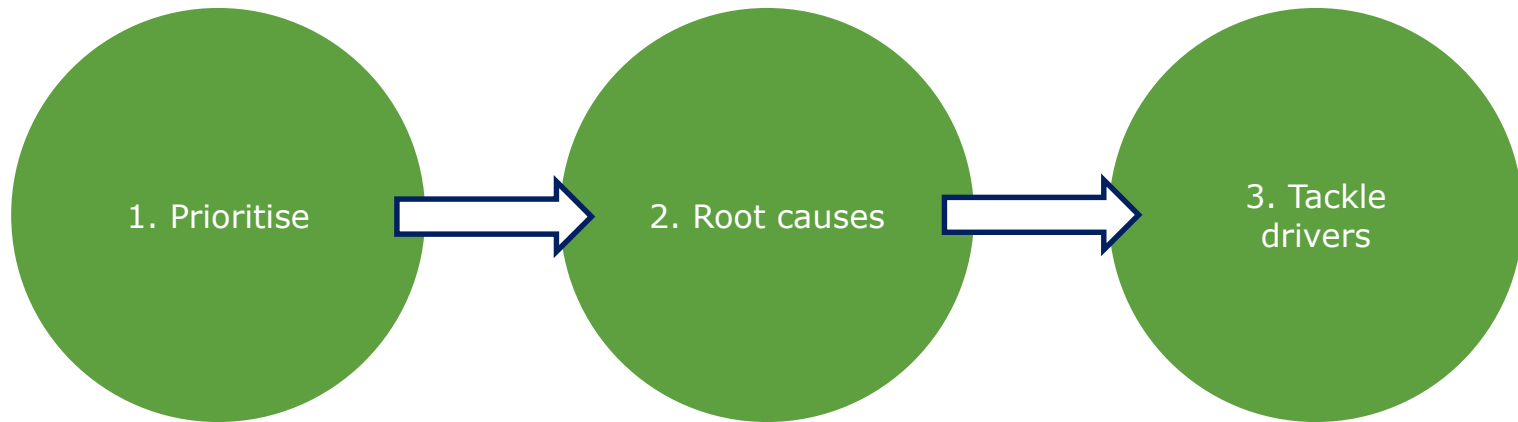


Calculation Methodology





An Approach to Taking Action

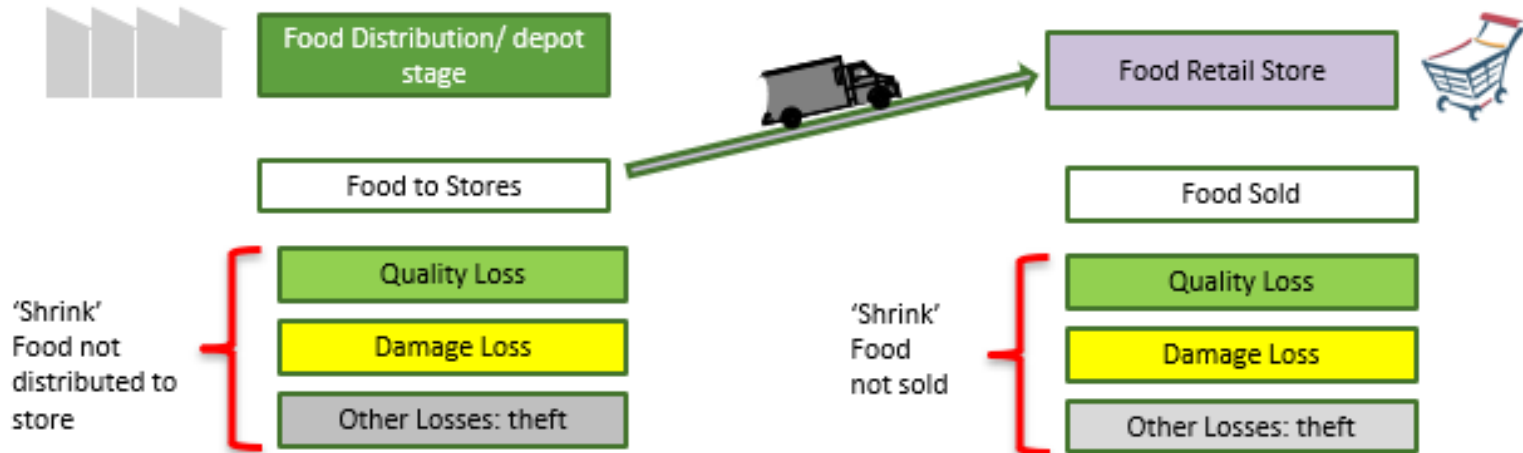


Understand Waste Streams

1. Identify sources of food not sold/distributed

Quality Losses + Damage Losses = Food Waste (depending on Destination)

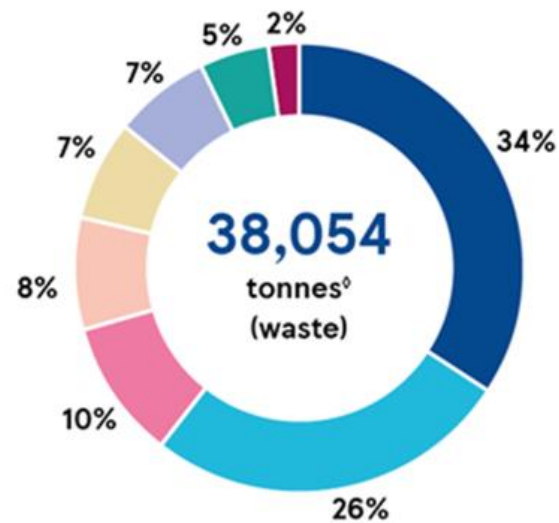
Other Losses = mainly theft





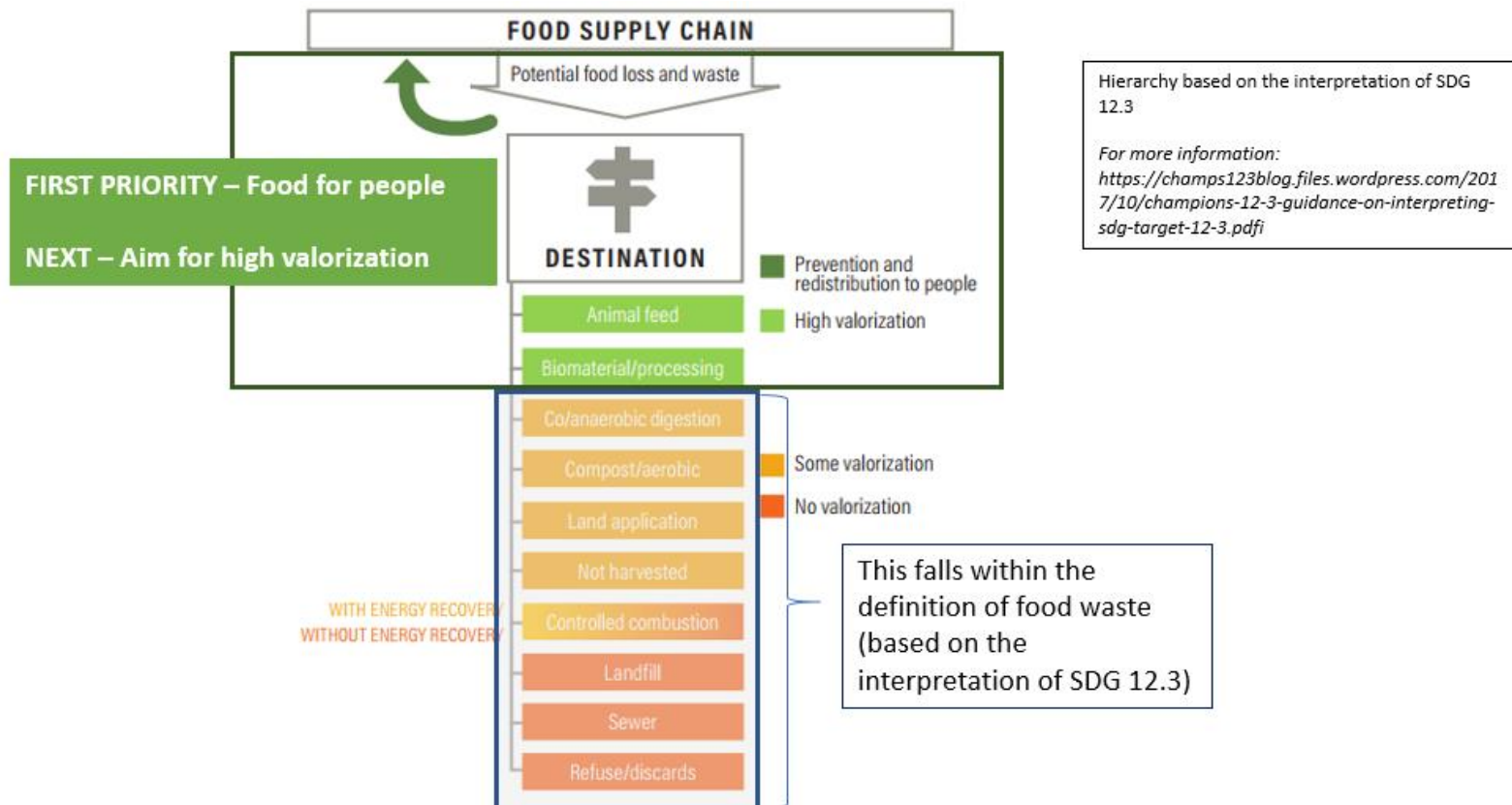
Understand Waste Streams

Central Europe – 2017/18 food waste by category
(% do not total 100% due to rounding)



- Bakery
- Beers, Wine and Spirits
- Dairy
- Grocery
- Impulse
- Meat, Fish and Poultry
- Prepared Foods
- Produce

Hierarchy of destinations



Source: WRI

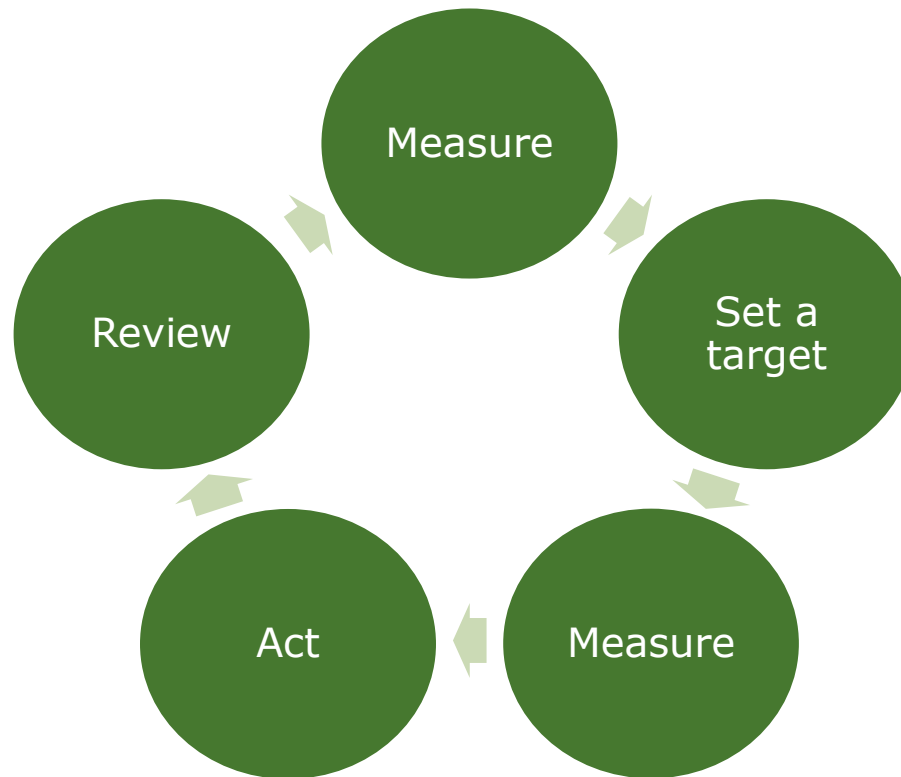


What can retailers do?

- Collaborating with suppliers to manage bumper crops
- Redistributing food to charities & food banks
- Diverting food surplus to animal feed
- Broadening specifications
- Improve forecasting and ordering mechanisms
- Packaging trials



Keys to Success





Thank you!

Tecla Castella, Head of UK Data Analytics
Tecla.Castella@anthesisgroup.com



Julian Parfitt, Resource Policy Analyst &
Practice Leader
Julian.Parfitt@anthesisgroup.com





Questions

Further research



International Journal of Production Economics

Available online 21 July 2017

In Press, Corrected Proof



Discounting and dynamic shelf life to reduce fresh food waste at retailers

M.E. Buisman , R. Hajjema, J.M. Bloemhof-Ruwaard



Gap analysis for decision support tools, models and libraries

REFRESH D2.6



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Asking questions on CoE



Dave Jones | 2 Days Ago

I'm interested to know how you managed to get the right mix of stakeholders around the table to set up the FA in each country.

Reply

👍 15 🗨️ 0



Toine Timmermans | 1 Minute Ago

In the Netherlands there was an existing high level platform of business and private sector actors. We were able to tap into this to create a working group of those most relevant to the objectives of our FA. Some advice would be to check out if such a platform exists in your country.

Reply

👍 15 🗨️ 0



Nora Bruggeman | 2 Seconds Ago

We first identified the mix of business and government and other stakeholders we wanted to involve. Then we had a series of bilateral discussions with each one to find out about their priorities and whether they would participate in such an agreement. As key stakeholders agreed, we found it was easier to persuade others to join.

Reply

👍 15 🗨️ 0

Thank you

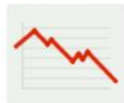


The banner features the Refresh logo (Community of Experts) in the top left, navigation links (About, Resources, Tools, Contact Us) and a 'Sign In | Share' button in the top right. The main text reads: 'Welcome to the Refresh Community of Experts. An online platform to find and share information and best practice on food waste prevention.' Below this are two buttons: 'Sign In | Share' and 'Browse Resources'.

The food resources being lost and wasted in Europe would be enough to feed all the hungry people in the world two times over (European Commission 2015).



88 million
tonnes of food waste a year produced by EU-28



€143 billion
estimated financial loss a year



70%
EU food waste arises at household, foodservices & retail sector



47 million
tonnes food waste contributed by household section alone

Across the globe, nearly 30% of food is wasted throughout the agrifood supply chain. According to the latest

www.refreshcoe.eu