

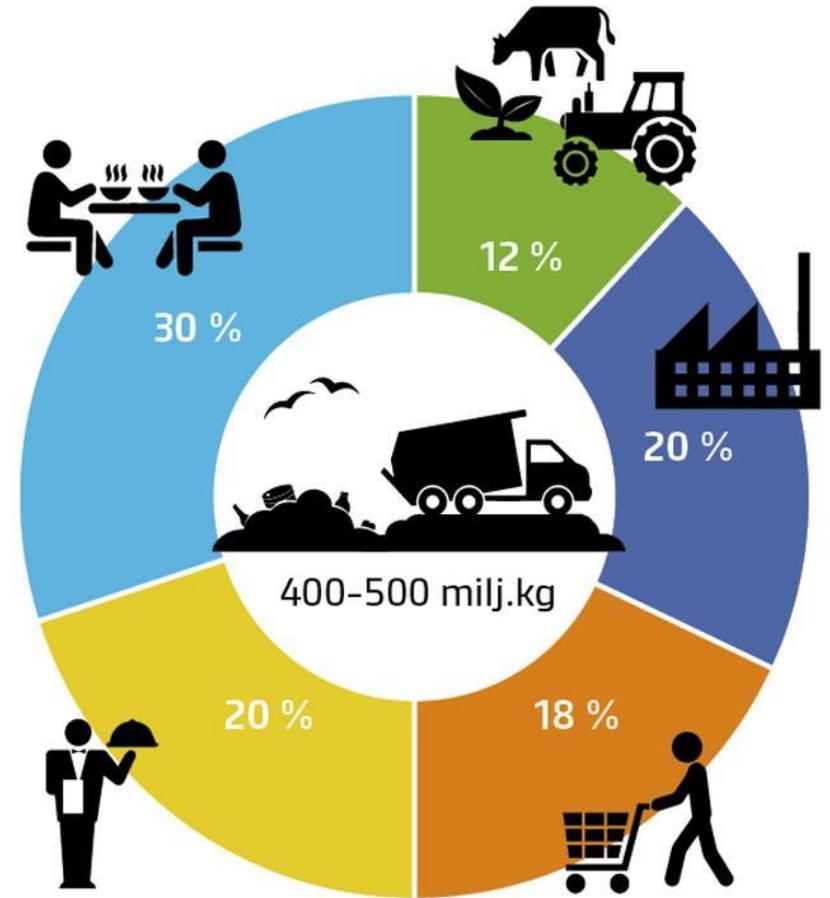
Quantification of food waste along the food chain in Finland

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Food waste quantification in Finland

- First food waste quantifications in 2008 (Luke)
- In Luke we have had several projects on food waste
- In Finland there is 400 - 500 million kilos food waste (including only edible parts) = around 15 % of food eaten

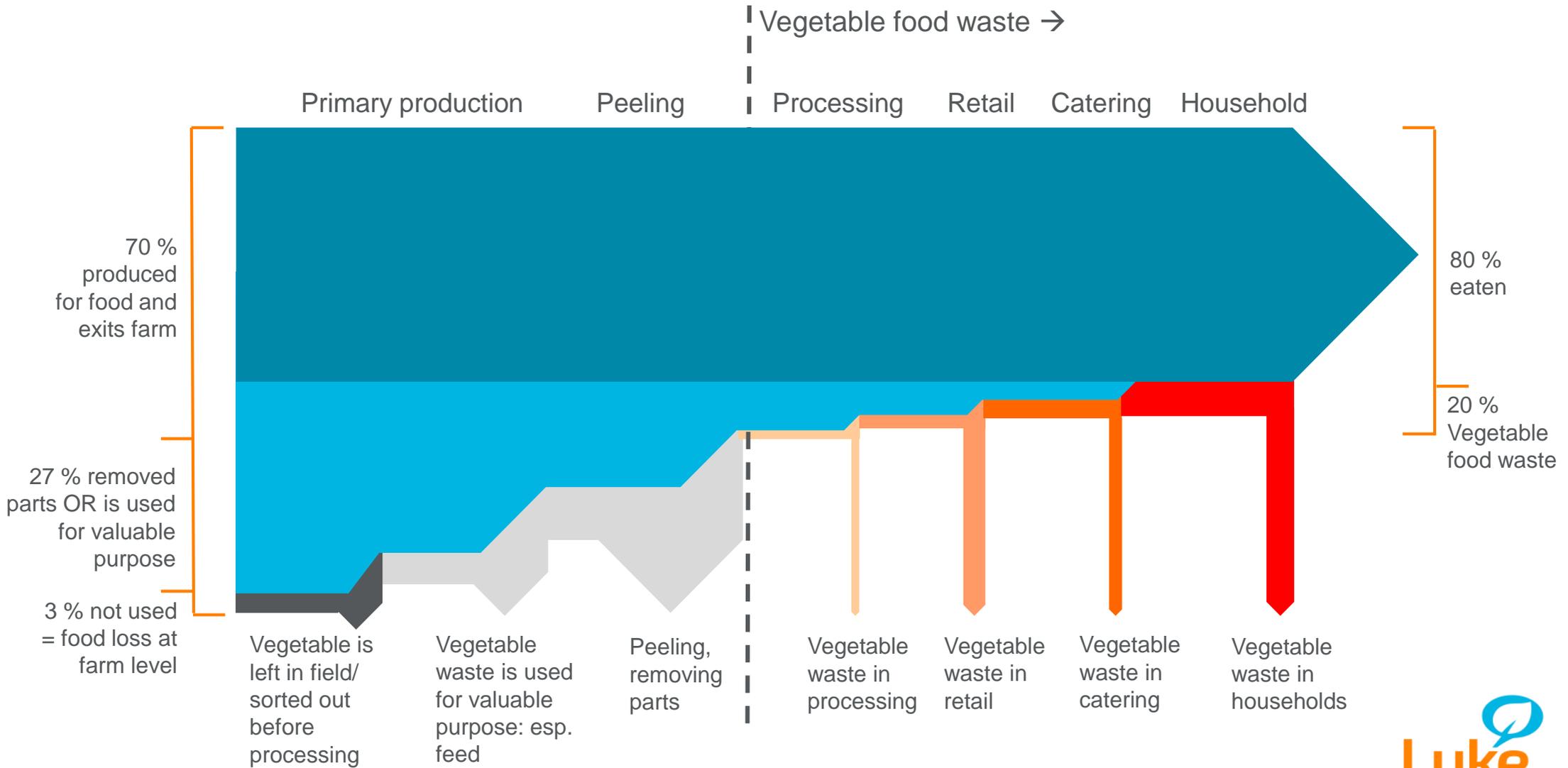


Food waste quantification in Finland

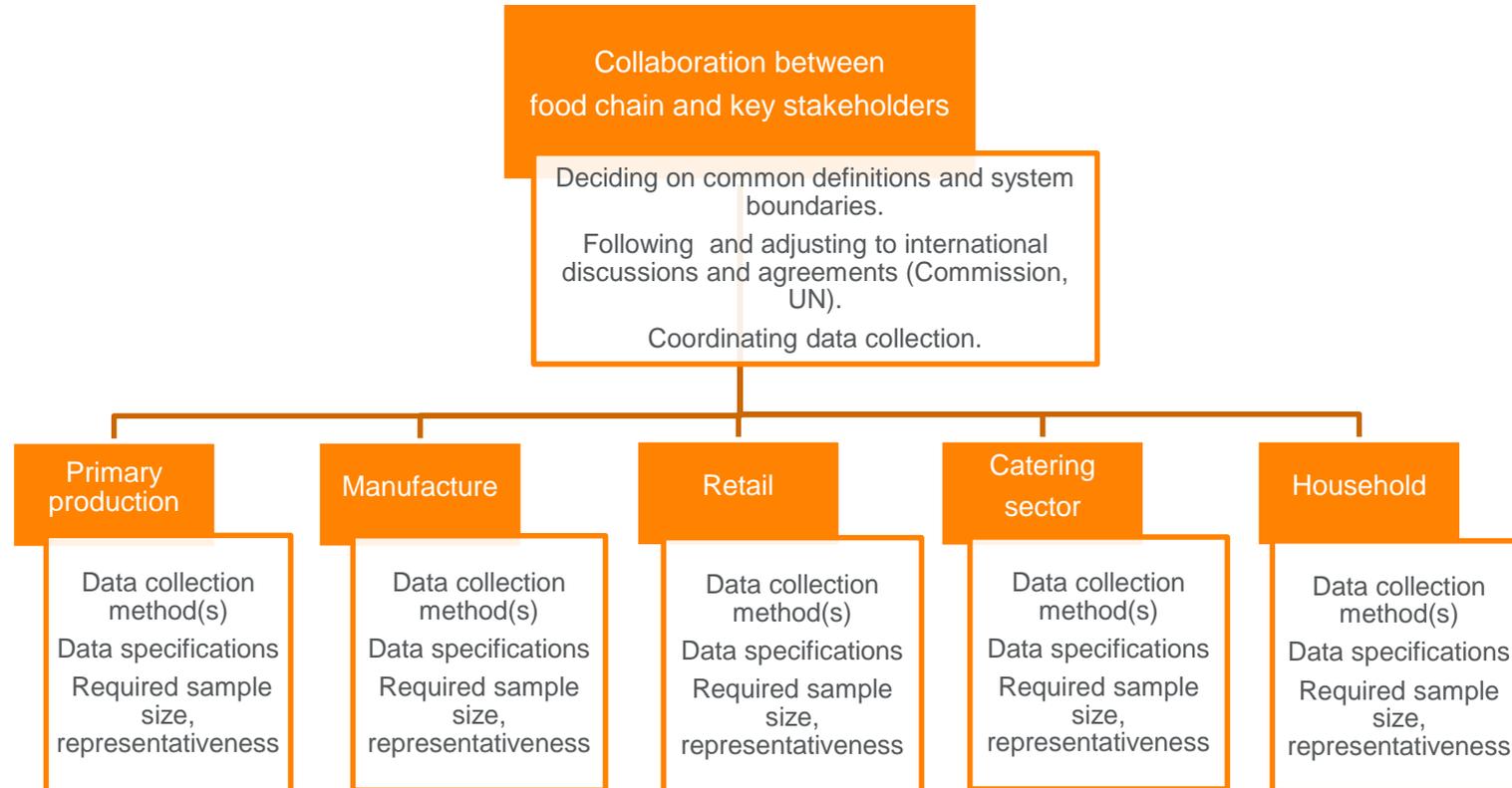
- Aim:
 - To build a permanent food waste quantification system in Finland by 2020.
- A national project 2018-2020: Building the system to quantify food waste
 - Covers primary production, food industry, retail, catering sector and households
 - Funding:
 - 3 ministries: Agriculture and Forestry, Environment, Economic affairs and Employment
 - Associations of: food industry (ETL), retail (PTY) and catering services (MaRa)
 - Project webpage: <https://www.luke.fi/ruokahavikkiseuranta/en/>

Vegetable waste, Finland

NB! This is only a demo. The values are rough and not based on detailed measurements.



Quality standard for food waste data collection in Finland



Data collection methods and desired sample sizes for each step of the food chain in Finland

Step of the food chain	Method	Desired sample size
Primary production – crops	Questionnaires: sent to producers simultaneously with crop production survey Interviews: supplementary	Producers representing 30% of cultivation area/case product
Primary production -, milk producers	Questionnaires Interviews: supplementary	Producers representing 10% of cultivation area/case product
Primary production - animal husbandry, fishing, fish cultivation	Statistics: dead/rejected animals, rejected marine fisheries Questionnaires: other animals/fish groups Interviews: supplementary	Producers representing 30% of cultivation area/case product
Manufacturing	Questionnaire Interviews: supplementary	Producers representing 30% of production volume//sector
Retail	Data collected by retail groups	The three biggest retail chains, representing over 90% of sector sales
Caterers	Food waste diary (D) Questionnaire (Q): supplementary	D: 20 caterers/caterer type = over 140 caterers Q: 500 caterers
Households	Online-questionnaire (Q): supplementary Waste composition analysis (W) Food waste diary (online) (D)	Q: 1,000 households W: 5,000 households D: 200 households



Food waste quantification in primary production

- Around 15 indicator products
- Online-questionnaires: cereals, vegetables, fruits, milk
 - Tested in previous projects
 - Aim to send the questionnaire at the same time as the existing data collection
- Statistical data: beef, chicken, pork

Survey on the use of carrots, white cabbages, food potatoes and strawberries

1. Use of crops on the farm

According to the crop and horticultural production survey, your farm produced the following total yield in 2017:
Instructions: Auto-filling was carried out in accordance with the crop production survey (for potatoes) or the horticultural production survey (for carrots, cabbages and strawberries). Only one crop per farm was included.

..... (name of crop) ____ kg

How and where are harvested crops used?
Instructions: If detailed data about volumes is not available, please estimate on the basis of the average volume for previous years. This includes all activities on the farm (storage, post-harvest treatment, packaging) before any further processing.

___ % used for food, including further processing
___ % used as animal feed
___ % used for composting/bio-waste collection
___ % used for energy production
___ % other, please specify _____

What are the reasons that part of the harvested crops are used for purposes other than food? Select 1-2 key reasons:

Factor related to size, weight, shape or appearance/ the buyer's criteria not fulfilled	
Larger crops than expected / crops ready for harvesting earlier than expected	
Difficulties with sales	
Storage losses, rot	
Other, please specify	

2. Volume of unharvested crops

Estimate the volume of unharvested crops.
Instructions: If there are no unharvested crops, enter zero.

..... (name of crop) ____ kg

Why did crops remain unharvested? Select 1-2 key reasons:

Overproduction/not profitable/no suitable buyer	
Factor related to size, weight, shape or appearance/ the buyer's criteria not fulfilled	
Availability of workforce	
Technical problems (e.g. damaged lifting equipment)	
Harvesting losses (e.g. some crops pass through lifting equipment or not all strawberries are picked)	
Weather	
Diseases, pests	
Other, please specify	

3. Further processing on the farm

How much of the total yield in 2017 goes for further processing (e.g. peeling, slicing, juice production, etc.)?
Instructions: Indicate further processing carried out in 2017 and an estimate of further processing to be carried out in 2018. If your farm is not engaged in further processing, enter zero.



Food waste quantification in food industry and retail

- Questionnaires have been developed in an open dialog with food industry and retail → there is willingness to share data
- Industry: online-questionnaire will be sent through the association of Finnish Food and Drink Industries Federation: covers the majority of the industry
- Retail and wholesale: concentrated data collection



Food waste quantification in food serving places

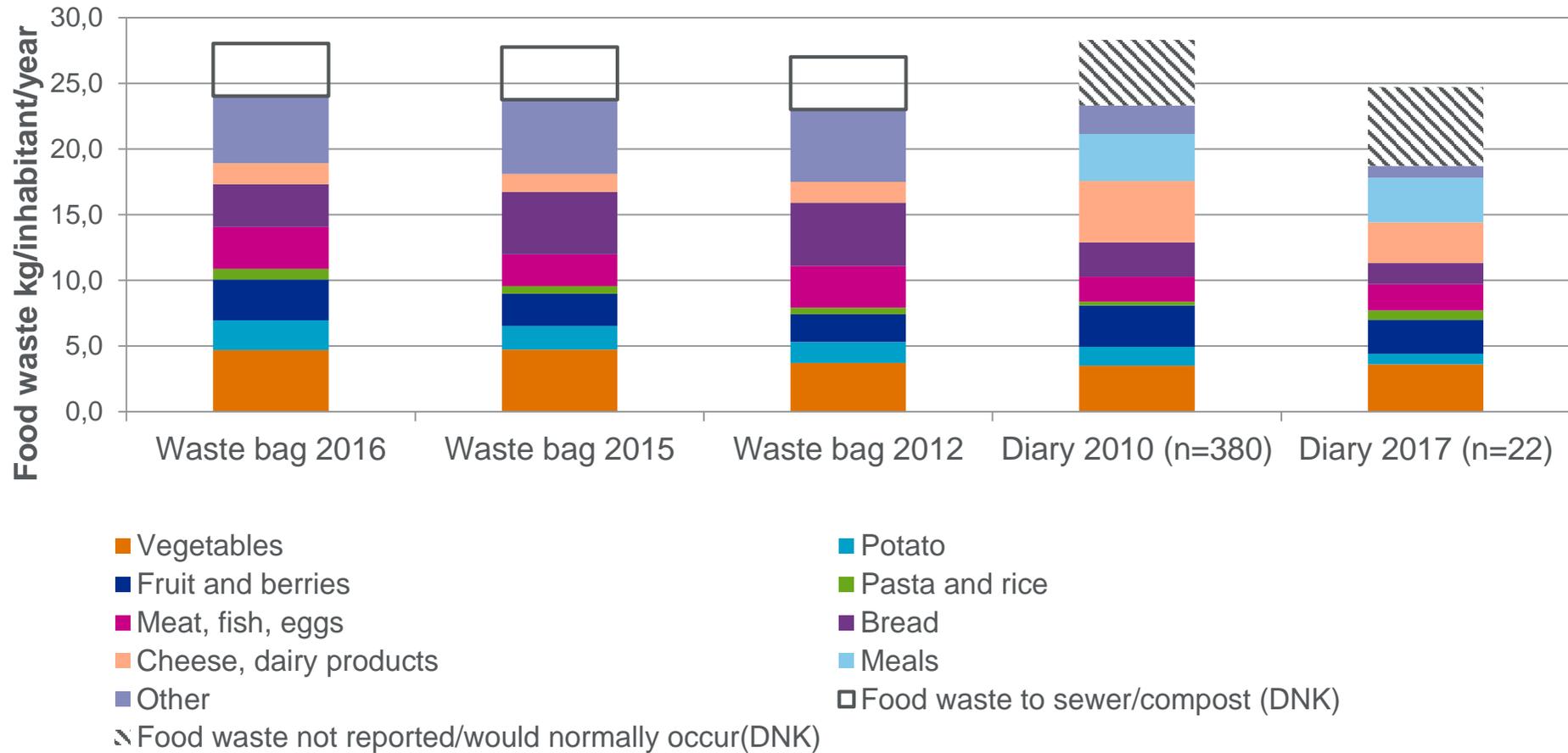
1. Online-tool to help food serving places to monitor and keep a diary on their FW: kitchen -, serving - and plate waste
 - Now in use in over 60 serving places: measurements from several weeks
2. Online-questionnaire is sent to 10 000 serving places
 - Questions: e.g. how many places monitor their FW, what is causing food waste, what measures are the most efficient

12. What is causing food waste in your serving place?

	Highly disagree	Somewhat disagree	Indifferent/ Don't know	Somewhat agree	Highly agree
We don't know how much food waste is produced and in what processes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Staff is not motivated to reduce food waste	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Inadequate overview or rotation of raw materials in stock	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Raw materials have a short shelf life and must be discarded before being used in production	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The raw materials are packaged in large units and we are not able to use up before goods get bad	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The food must be discarded because it is too long in the buffet or counter	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Customers take too much food which cause plate waste	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Portion sizes are too big	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Plates are too big	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Scoops are too big	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is hard to forecast the food sales	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Food is not to customers' taste	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of knowledge what customers want	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There are too many food options	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There are no options to use food that was not sold	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Not selling food for lower price in the end of the day	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Not giving food to the charity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other, what?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other, what?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other, what?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



Food waste in Finnish households – comparing two methods: waste bag and diary



<https://jukuri.luke.fi/handle/10024/544072>



Food waste quantification in households

1. Diary: 'Online food waste diary'-tool is now under development
 - Test-lab to find ways to measure food waste without kitchen scales and make the user experience as smooth as possible
2. Waste bag analysis: measurements are repeated in different cities in Finland



Thank you!