

# Food waste in hospitality sector

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### Results from WASTESTIMATOR project

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# Luke Food Waste Research 2010-2017



## Primary production, Food Industry

- Interviews, statistic

## Retail

- Interviews

## Redistribution Nordic Projects

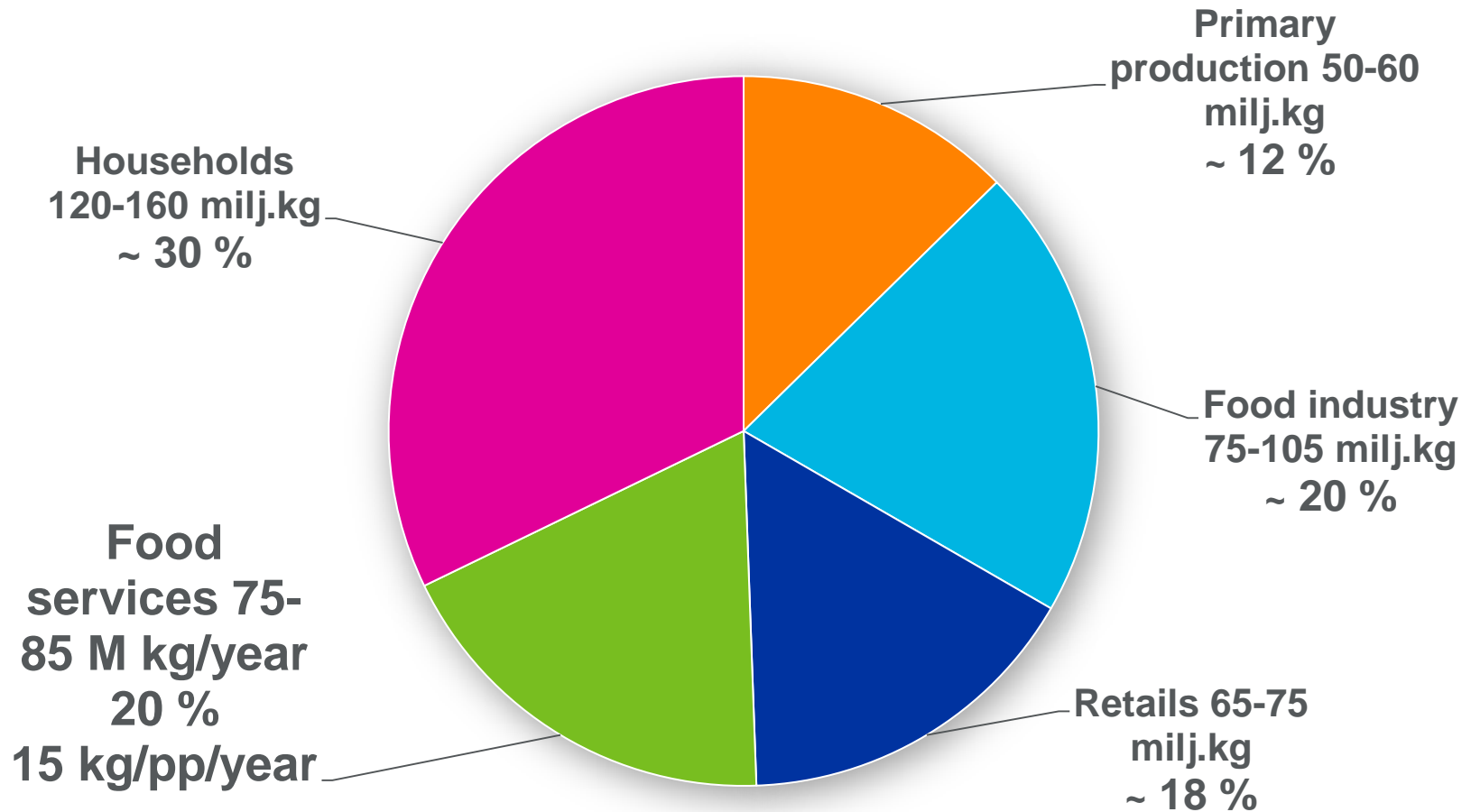
## Households

- Food waste diary study
- Surveys
- Group interviews
- Landfill sorting studies

## Restaurant services

- Waste measurements
- Workshops

# Total volume of avoidable food waste about 450 million kilos in a year, 10 - 15 % of food consumed.



Sources: MTT Foodspill (e.g. Katajajuuri et al. 2014, Silvennoinen et al. 2014)

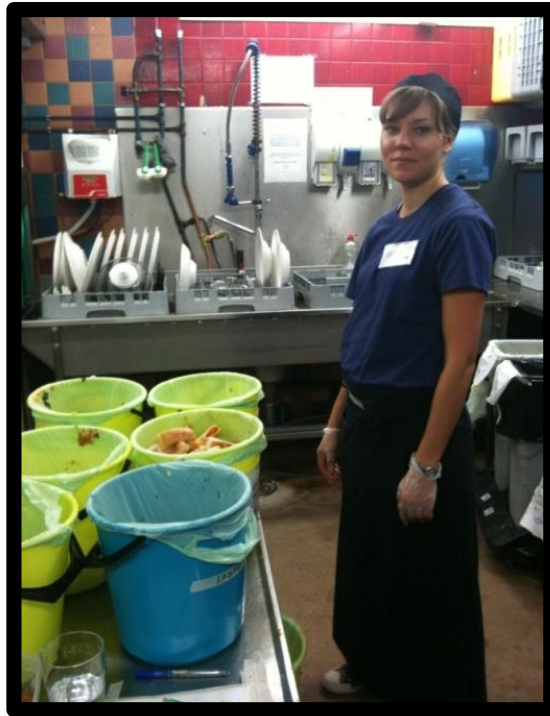
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# Food service sector

## Projects to estimate amount, origin and type FOODSPILL 2011, WASTESTIMATOR 2016-17 CIRCWASTE 2017-2019

- Different kind of outlets: e.g. schools, kindergartens and workplace restaurants.
- The food waste was divided into two categories
  1. Avoidable food waste
    - e.g. spoiled products, overproduction
  2. Unavoidable food waste
    - e.g. vegetable peels and bones
- For weighing and sorting the avoidable food waste was divided into three categories:
  - Kitchen waste
  - Service waste
  - Customer leftovers







# Forum for food services *Ravintolafoorumi*

<https://www.luke.fi/ravintolafoorumi/foorumi/>

- We established platform for different kind of services (54 participants)
- Home page including:
  - Web registration
  - Material and guidance for measuring
  - Materials for education and encouraging personnel
  - Publications and events
  - Tools for decreasing



Etusivu Ruokahävikki ▾ FOORUMI ▾



#### Tervetuloa Ravintolafoorumiin 2016 – 2017! Vähennä ruokahävikkiä!

Kaikentyyppisille ravitsemispalveluille tarkoitettu verkosto alottaa keväällä 2016. Taustana foorumille on Euroopan komission tavoitteet vähentää ruokahävikkiä ja lisätä kiertotaloutta. Osallistujille tarjotaan mahdollisuus vapaaehtoisuuden ja yrityksen omien tavoitteiden mukaisesti lisätä resurssitehokkuutta, yhteistyötä sekä viestintää. Foorumi toimii alustavan suunnitelman mukaan vuoden ajan keväeseen 2017 ja on osallistujille maksuton.

Tarkoituksena on perustaa uudentyyppinen kanava, jossa yritykset voivat helposti aloittaa tai tehostaa biojätteen ja/tai ruokahävikin mittausta, seuranta- ja hallintamenetelmiä sekä tiedottaa samalla henkilökunnalle ja asiakkaille asian tärkeydestä. Foorumissa saa asiantuntija-apua, valmista materiaalia hävikin vähentämiseen liittyviin kampanjoihin, uusiin työtapoihin ja hävikin mittaamiseen sekä hallintaan.

#### FOODSPILL hanke selvitti ruokahävikin määrää ruokaketjussa

Ruuan päätyminen jätteeksi on ekologisesti ja taloudellisesti kestämätöntä. Raaka-aineiden tuotannosta ja prosessoinnista aiheutuneet ympäristövaikutukset ovat syntyneet turhaan. Yksinkertaisimpia keinoja vähentää elintarvikeketjun

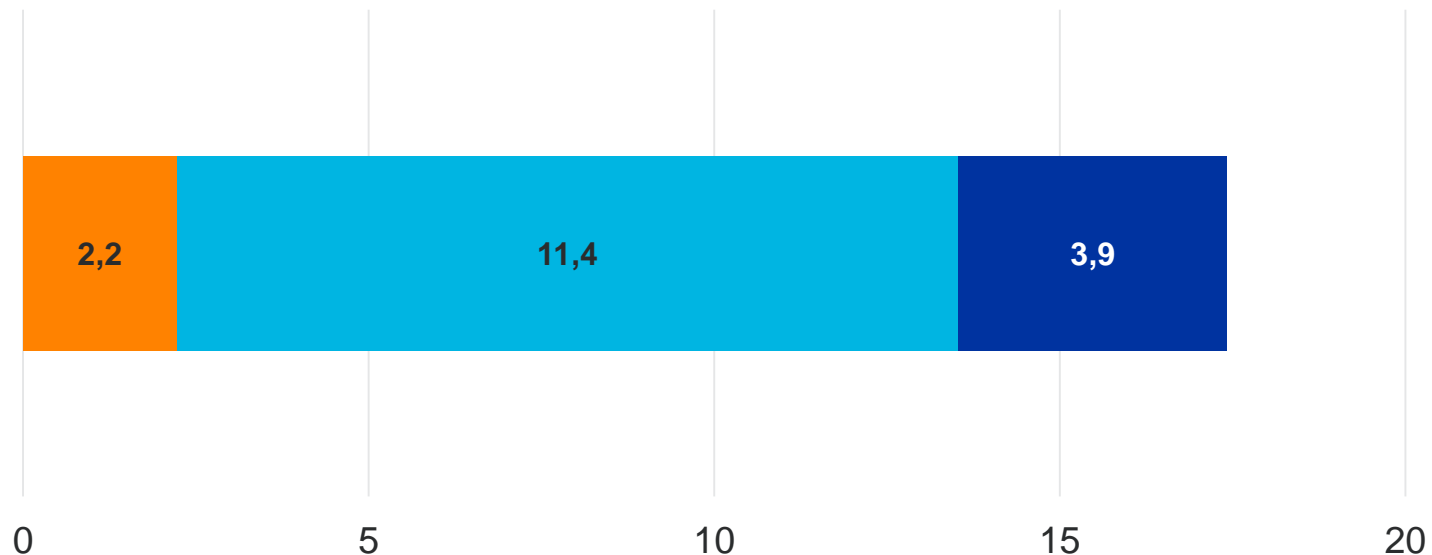


# Wastestimator research methodology

- Ravintolafoorumi members were asked to participate in the food waste measurement study
- In the end 26 schools, 13 day-care centres, 7 student and workplace canteens and 5 vocational schools were willing to participate and accepted in the study
- Some restaurants used a measuring sheet designed by Luke while others used their own sheets
- Restaurants reported
  - The amount of food that was produced
  - Kitchen and service food waste as well as customer leftovers
  - The number of customers each day

# Aggregate results: food waste by origin

- In total 17,5 % of prepared food was wasted
- The most significant cause was service food waste, 11,4 %

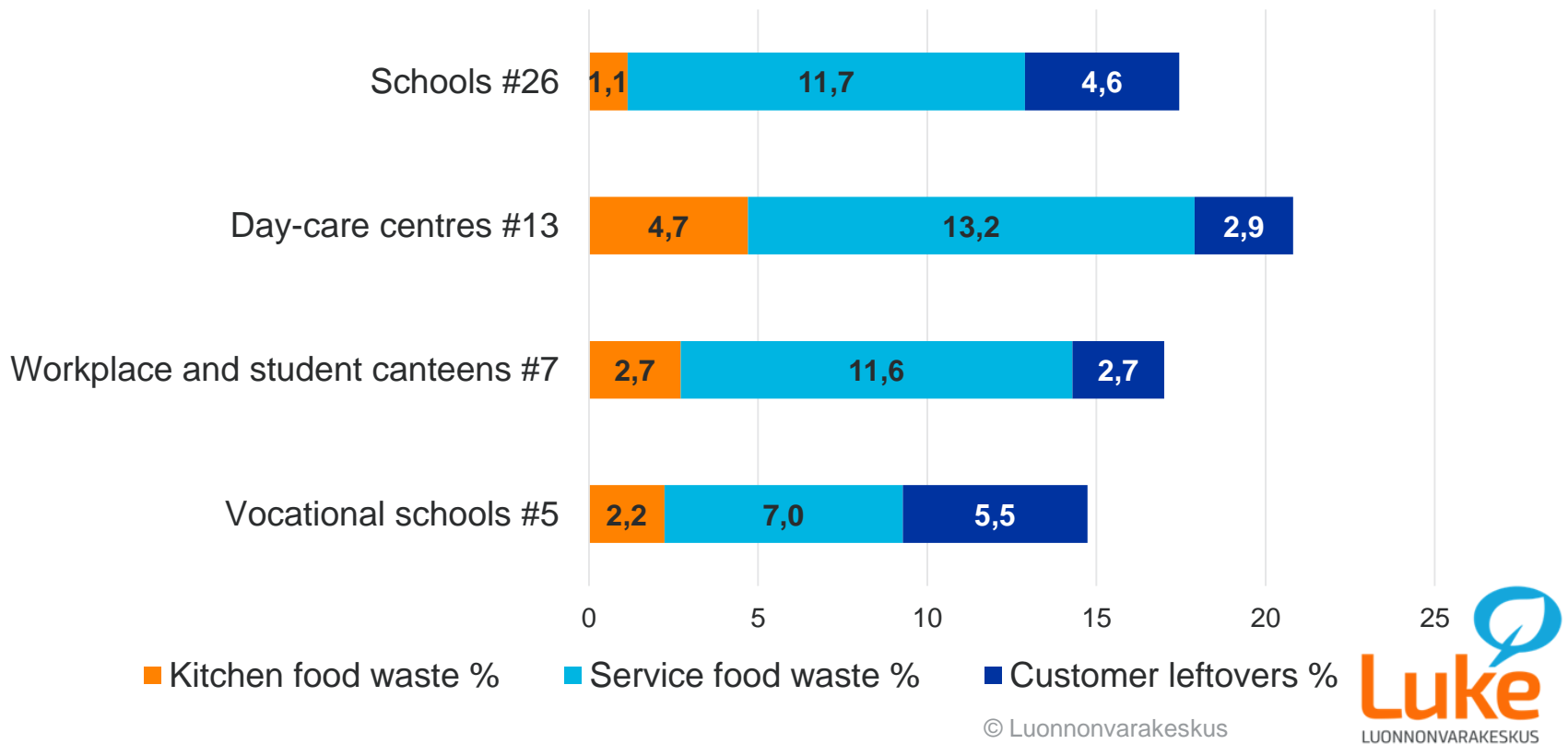


■ Kitchen food waste % ■ Service food waste % ■ Customer leftovers %



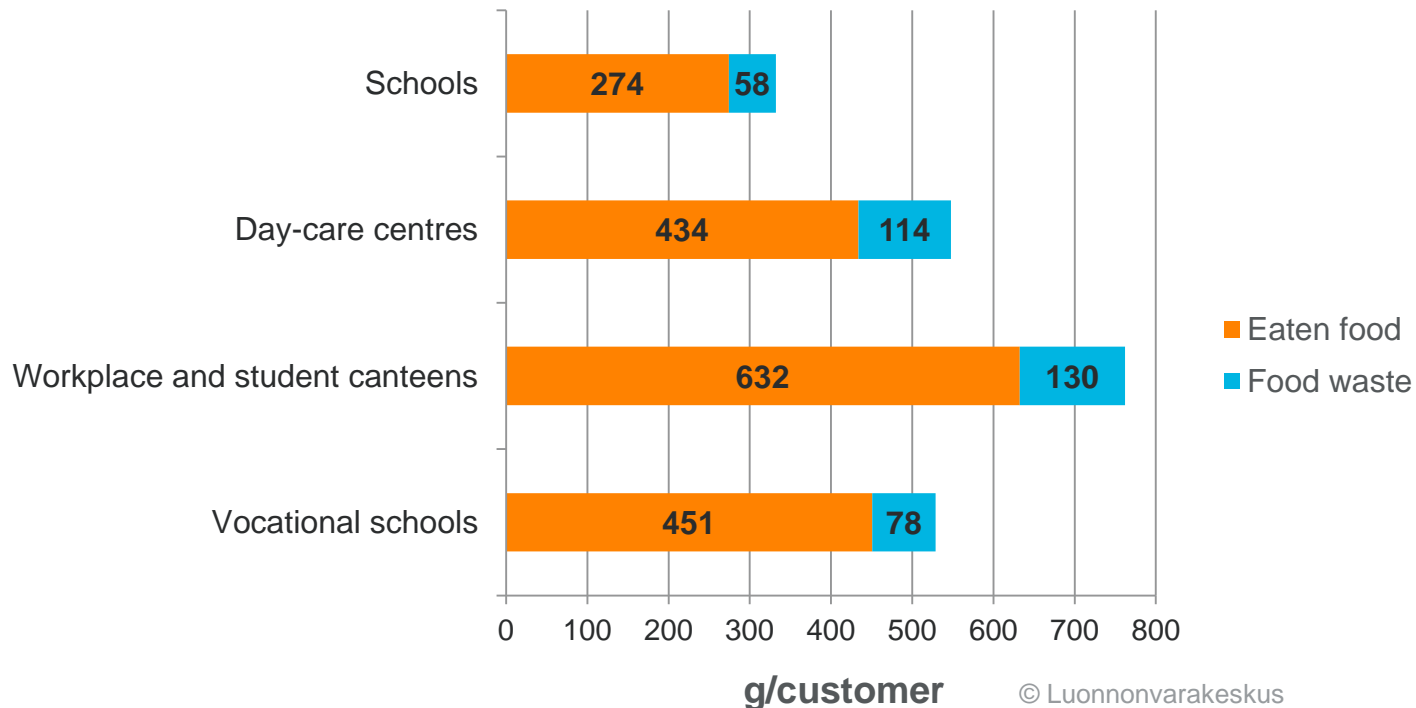
# Results by sector

- There were some differences between the studied sectors both in the amount of total food waste and in the origin of the waste



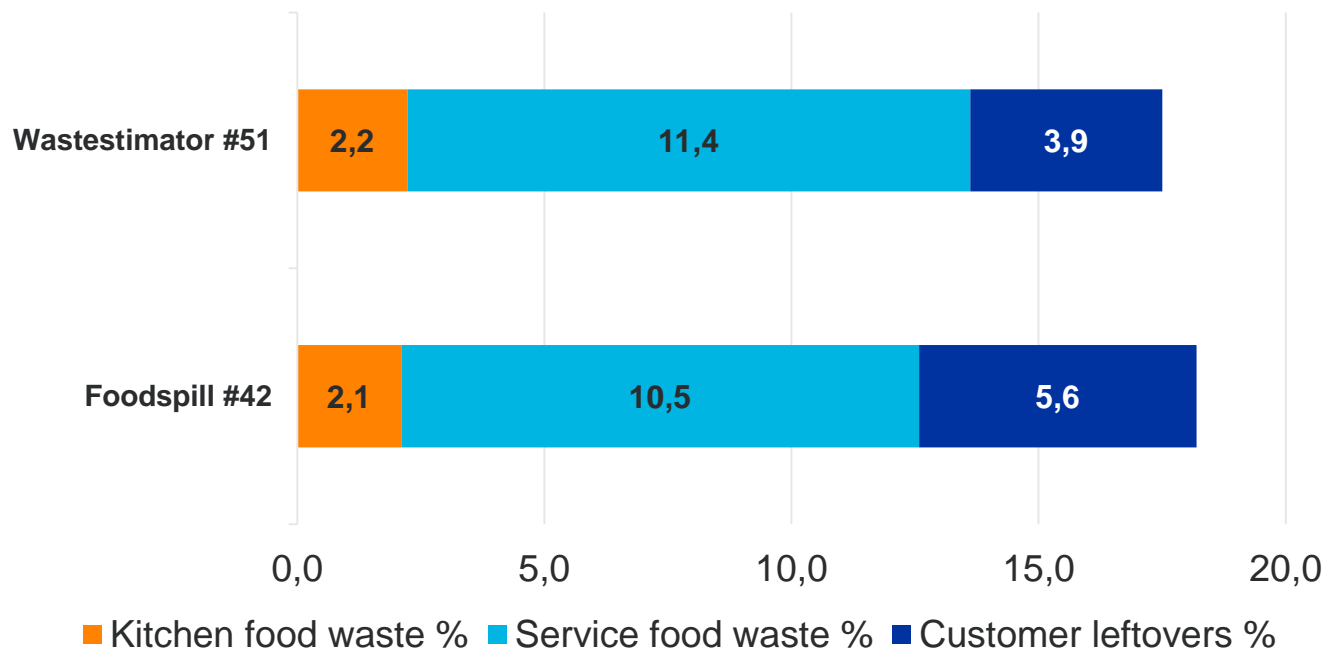
# Results: absolute amounts of food waste produced g / customer

- When comparing the absolute amounts of food waste produced, the comparison between the sectors looks a bit different
- A large amount of food prepared per customer leads to a large amount of food waste per customer as well



# Comparison with earlier studies

- The total food waste percentage was slightly smaller when compared to the earlier Foodspill (2012) study
  - Customer leftovers percentage was quite a bit smaller than earlier
  - Kitchen and service food waste percentages were about the same
  - The studies are not truly comparable



# Estimate for national food waste in food service sectors

- We estimated the amount of food waste produced in every studied sector
- We made use of the statistics for the number of portions produced in each sector (Horeca register 2015)
- Some sectors are missing, e.g. a la carte, hospitals, hotels

Sector	Sector total waste (%)	No of portions (M)	Portion size (g/portion)	Total food waste (M kg)
Schools	17,4	147,56	332	8,6
Day-care centres	20,3	26,04	548	2,9
Student and workplace canteens	17,0	69,44	762	9,0
Vocational schools	14,7	52,08	529	4,1

# Estimate of economical losses due to food waste

- According to a report by Finnish National Agency for Education the mean price for a school lunch in 2015 was 2,67 €
- The number of portions served in schools annually is 147,56 million
- As according to our study 17,5 % of food is wasted in schools, the annual monetary loss can be estimated to be about 69 million €
- The cost of one kg of wasted food is about 8 €
- This sum includes food resource costs, transportation costs and production costs, i.e. wages for kitchen staff

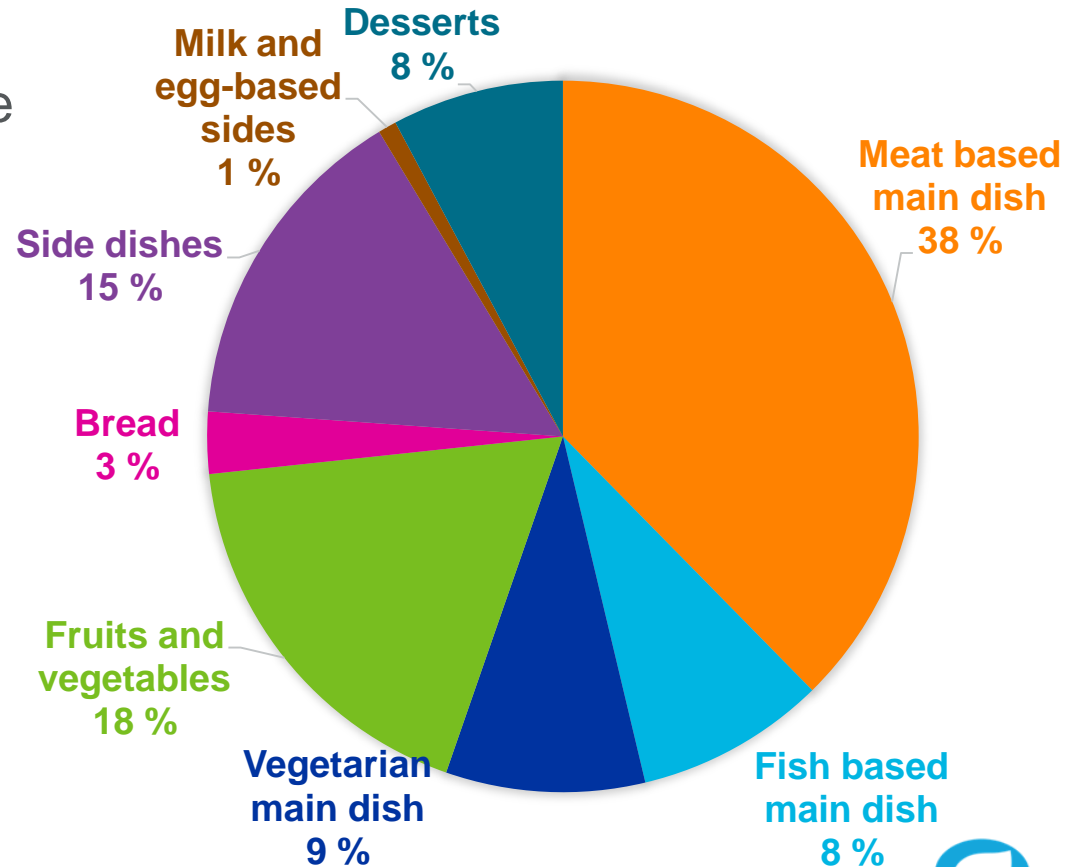
# Estimate of environmental impacts of food waste

- It is difficult to estimate the environmental losses, because there are great differences between dishes in their environmental impacts
- Additional factors to consider: milk, domestically grown vegetables
- A few example calculations for yearly impacts of wasted school meals:
  - Meat and macaroni casserole: 53 million kg of CO<sub>2</sub> equivalents, 53 tons of PO<sub>4</sub><sup>3-</sup> equivalents
  - Vegetable and macaroni casserole: 15 million kg of CO<sub>2</sub> equivalents, 16 tons of PO<sub>4</sub><sup>3-</sup> equivalents
  - Curry chicken and rice: 32 million kg of CO<sub>2</sub> equivalents, 30 tons of PO<sub>4</sub><sup>3-</sup> equivalents
  - A very rough estimate using the mean impact of these example dishes: 33 million kg of CO<sub>2</sub> equivalents, 33 tons of PO<sub>4</sub><sup>3-</sup> equivalents



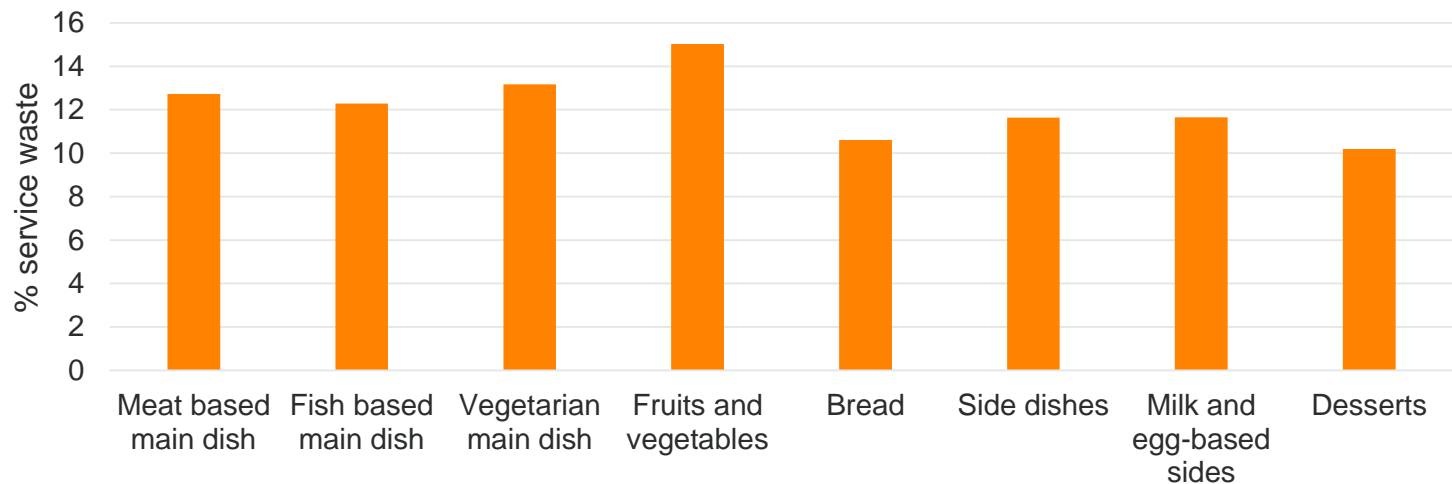
# Composition of service food waste in schools and day-care centres (1)

- Information on the composition of food waste was available only for service food waste (left over from buffet) in schools and day-care centres
- The numbers mainly reflect the composition of served food



# Composition of service food waste in relation to produced food in schools and day-care centres

- We get a better understanding of the composition of service food waste, if we look at what percentage of each produced food type ends up as service food waste
- Now the differences between food types are much smaller, but we can see that fruits and vegetable produce a bit more waste, while desserts produce the least



# An ideal study of food waste

- Random sampling
- A fairly large number of participants from every sector
- Use of scale
- Daily records
- Long measurement period (a menu cycle)
- Essential data:
  - Amount food waste: kitchen, service and customers
  - Amount of produced food and number of customers
  - Separate sorting and measurement for edible and inedible waste
- Indicators: percentage of produced food that ends up as waste (FW%), food waste per customer
- Motivated management and staff

# Experiences about factors behind food waste

- Factors in planning
  - The difficulty of prediction, leading to overproduction
  - Storing of foodstuffs and risk-taking capacity
- Factors in attitude and awareness
  - Is there true will to reduce food waste?
  - Incompetence, negligence
  - Apparent hurry
- Factors in portions
  - Portion size
  - The number of portions
  - Recipes

# Experiences about best practices to reduce food waste

- Work control and direction, waste measurement
  - Ingredient check-in
  - Cooperation with wholesale companies
  - Ingredient cycle and choice planning
  - Exact waste measurement
- Planning
  - Centralised ordering system, correct size of orders
  - Menu planning based on extensive experience
  - Standardised set of recipes
- Change attitudes, increase awareness
  - Orientation and discussion
  - Estimate the monetary losses caused by food waste

# Experiences about measuring food waste

- A simpler form would make measurement easier
  - All staff should be able to measure
  - It's more work to separate originally edible and inedible waste, on the other hand this has been successfully done in quite a few restaurants
- Some restaurants have found it to be more efficient to measure only waste
- It's difficult to carry out comparable measurements in separate kitchens
- Computer applications could be handier than paper forms for recording measurements
- Measurement results are not sufficiently made use of in increasing awareness
- It's impossible to measure customer leftovers in take away restaurants



Tak!

Kiitos!

