



University of Stuttgart
Germany

Quantification of Food Waste within the German Food Chain

Methods and selected results

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Outline



Food Waste (EU Delegated Decision)



Methods and Data Sources



Quantities in the German Food Chain



Case Study - Food Service Sector



Discussion

Food Waste (ANNEX III)

Delegated Decision supplementing Directive 2008/98/EC

Measurement Methods					
Direct Measurement					
Mass Balance					
Waste compositional analysis					
Questionnaires and interviews					
Coefficients and production statistics					
Counting/Scanning					
Diaries					



Foreseen methods of measurement



Not foreseen methods of measurement

Food Waste (ANNEX III)

Delegated Decision supplementing Directive 2008/98/EC

Measurement Methods					
Direct Measurement				✓	
Mass Balance	✓	✓			
Waste compositional analysis				✓	✓
Questionnaires and interviews		✓	✓		
Coefficients and production statistics	✓	✓	✓		
Counting/Scanning			✓		
Diaries				✓	✓



Used methods of measurement



Not foreseen methods of measurement

Food waste - primary production

Primary Production



Waste coefficients
(Literature)



Food Waste

Statistics on
food production
in agriculture



Nutritional
Database
(>2,000 data sets)



Inedible parts
(e.g. bones & peels)



Source: www.deutschlandfunk.de (ZB)

Food Waste - processing and manufacturing

Processing & manufacturing



100 data sets

Food waste

PRODCOM Data
(production statistics)



Waste coefficients



1. Wirtschaftung (bis einschließend)			
□	03.1	Schlachten und Fleischverarbeitung	
□	03.2	Fischverarbeitung	
□	03.3	Obst- und Gemüseverarbeitung	
□	03.4	Bereitstellung von Pflanzenöl und tierischen Ölen und Fetten	
□	03.5	Milchverarbeitung	
□	03.6	Mehl- und Stärkeerzeugnisse, Herstellung von Stärke und Stärkeerzeugnissen	
□	03.7	Herstellung von Back- und Teigwaren	
□	03.8	Herstellung von Soda, Nahrungsmitteln (Zucker, Süßwaren, Tee, Kaffee, Alkohol und Malt)	
□	11	Getränkherstellung	
2. Produktion (bis einschließend)			
Produktionskategorie	Stärke	Nichtstärke	
Unterprodukt			
3. Organische Abfallmenge (bis einschließend)			
Organische Abfallmenge pro Jahr (Schwundstoff)	Stärke	Nichtstärke	Σ
- davon Technische Strömungen *			
- davon Prozessverluste			
- davon Interferente Materialien			
- davon Benutzungs- und Verluste **			
- davon Qualitätsmängel ***			
- davon Temperaturverluste ****			
- davon Verluste aus Handhabung			
- davon Sonstige Verluste			

- 3,475 companies surveyed
- 100 surveys answered

Food waste - retail

Retail



Sales area in m²

(Source: national statistics)



77 data sets



Waste coefficients
in kg/(m²·sales area)



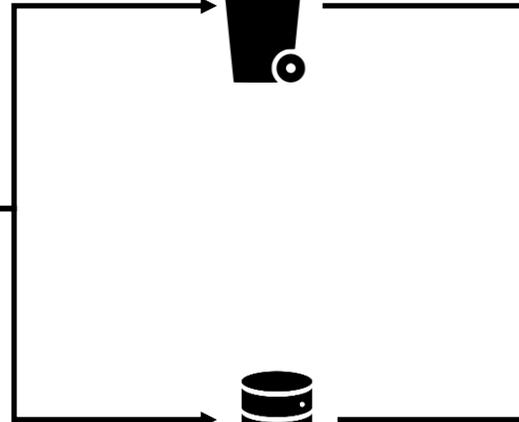
Food waste

Food waste - food service sector

Food service sector



Waste statistics
(e. g. EWC code 200108)



Food waste

Food waste - food service sector

Households

Waste statistics

Diaries



+



compositional analysis
(> 100 data sets)

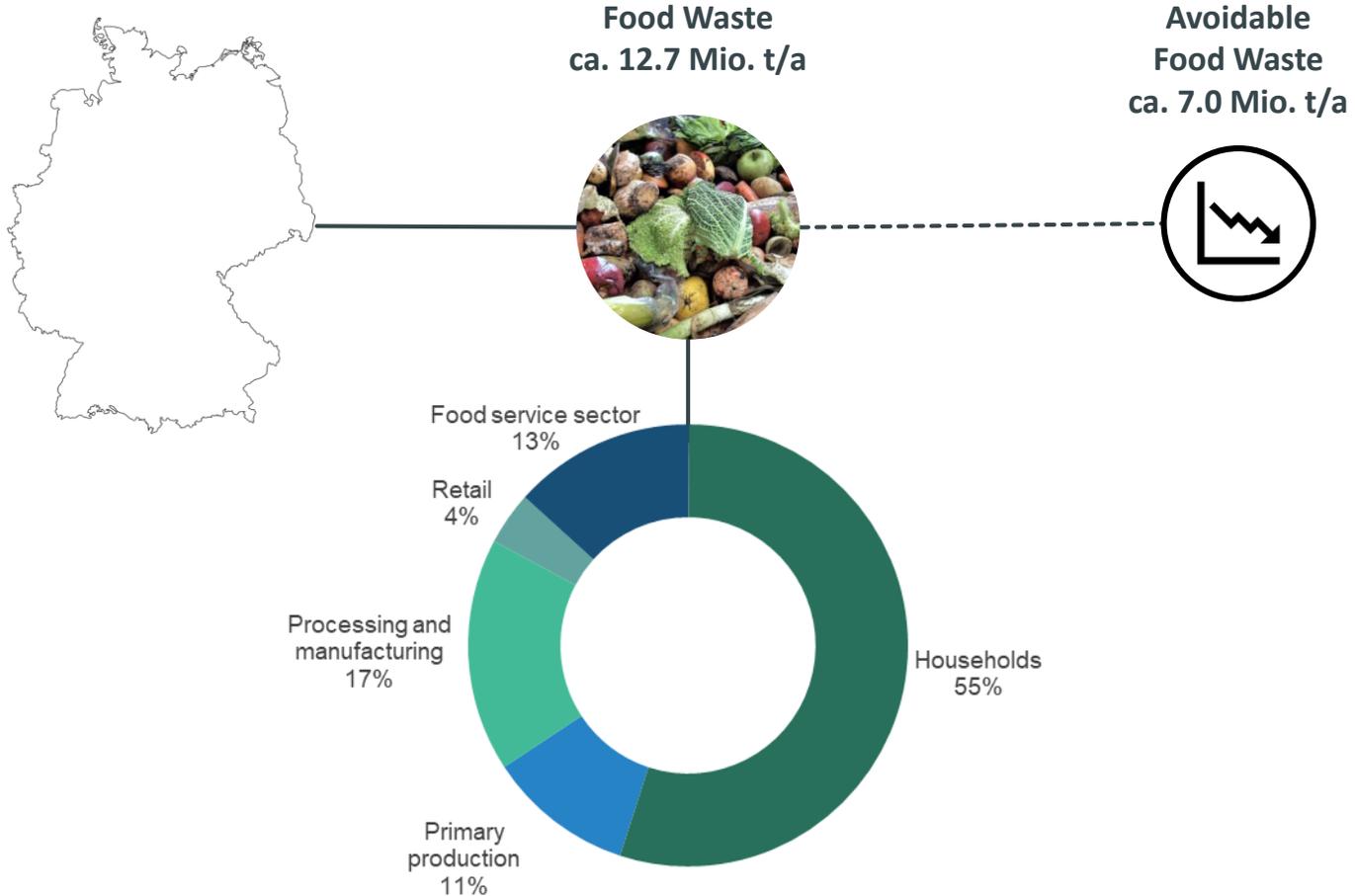
6,000 households
(GfK study)

Food waste



source: own photo

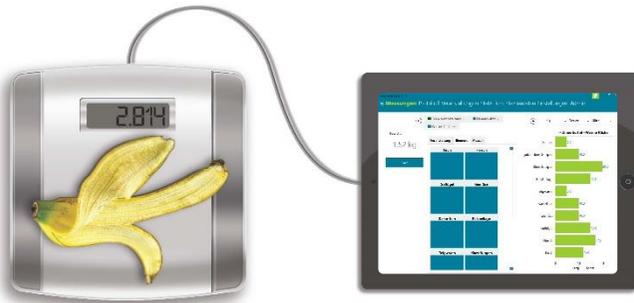
Food waste – German food chain



Food waste quantification

Food service sector

Self-reporting in gastronomic kitchens



FOOD

Food waste quantification

Food service sector

Experimental Setup

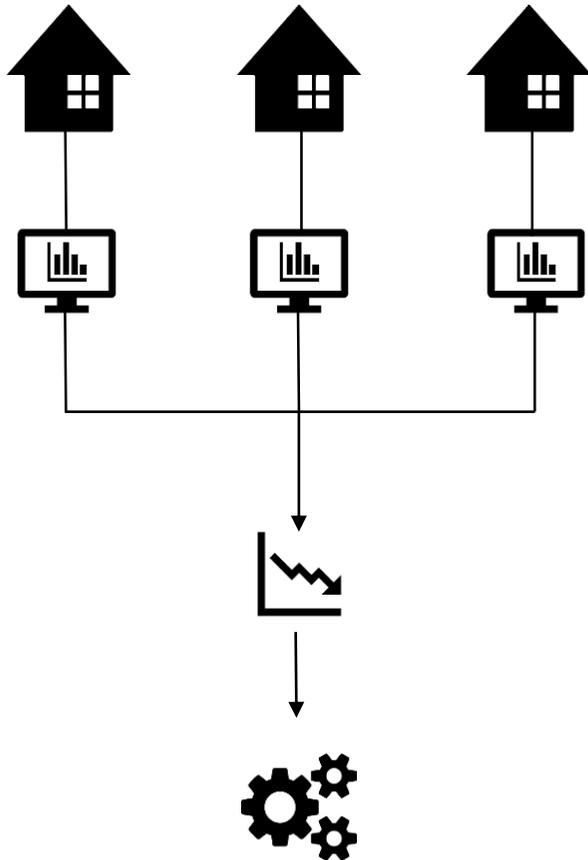
- All-in-One-PC
- Electronic scale
- Software & user interface



 RESOURCEMANAGER

FOOD

Food waste quantification



Analysis: 3 Hotels (same size)

Food waste quantification

Food waste prevention

Identification of effective measures

Food waste quantification

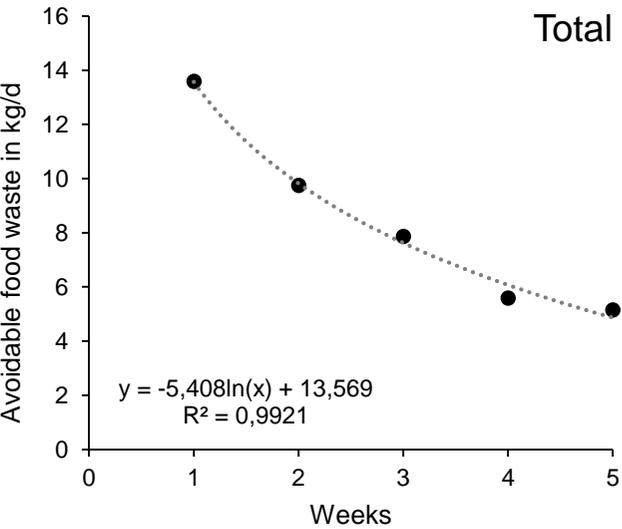
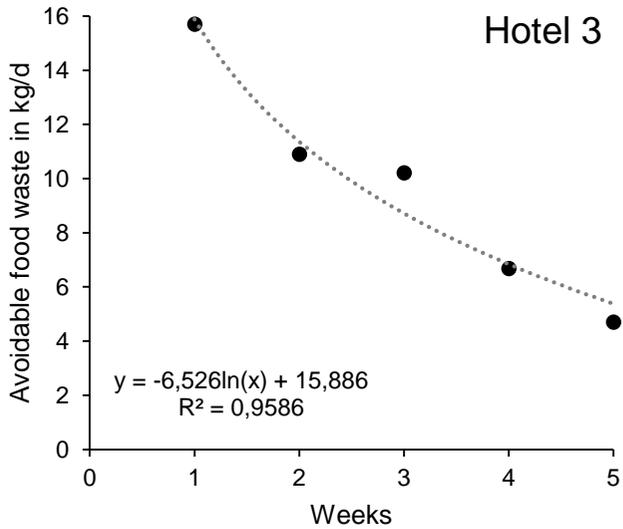
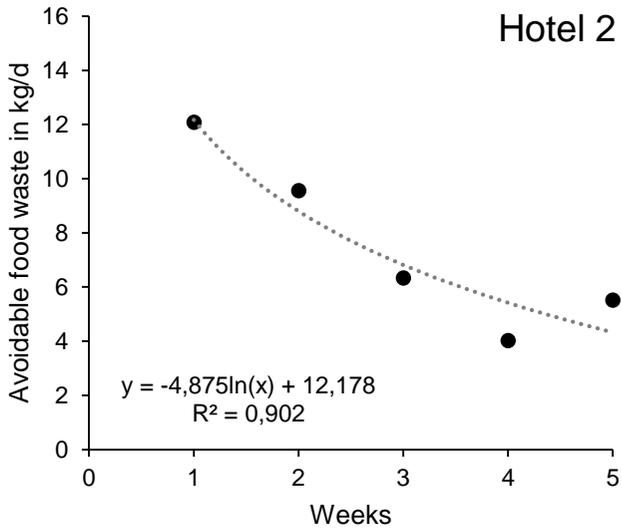
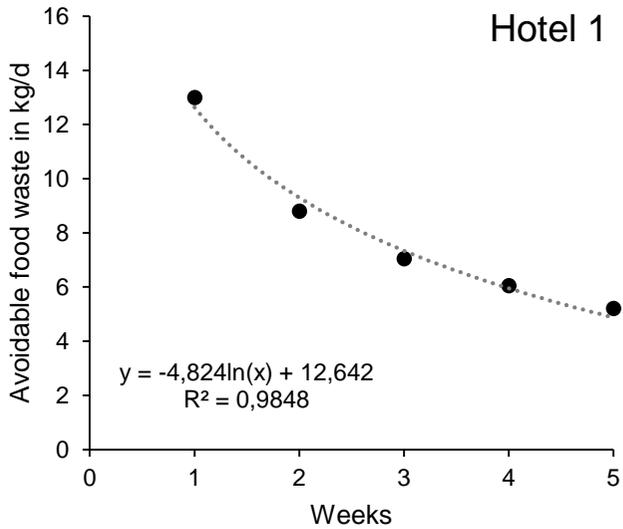
Product presentation - Breakfast Buffet (Hotel)



Food waste quantification

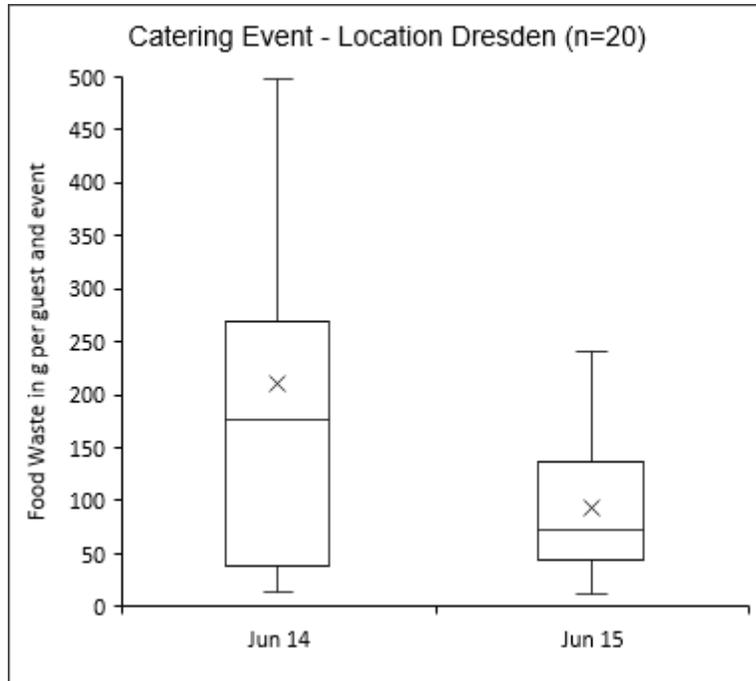
Initial Situation: Food waste – Returns from Breakfast Buffet (Hotel)



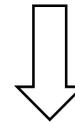


Food waste quantification

Derived Measures from Monitoring - Example



GN 1/1 Container - 16 Liter



GN 1/2 Container - 8 Liter



Conclusion and summary



- Food waste in Germany: ca. 12.7 Million tons per year
- Avoidable food waste: ca. 7.0 Million tons per year
- Significant reduction of food waste through self-reporting
- SDG 12.3 (halving food waste) achieved:
 - Hotels
 - Event caterings



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Thank you for your Attention!



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