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# Workshop o oběhovém hospodářství a skládkování Žitava-Liberec 2024

## Kreislaufwirtschafts- und Deponieworkshop Zittau-Liberec 2024







# Kuchynské odpady - niekoľko údajov zo Slovenska.

**Ing. Marek Hrabčák**  
**29.10.2024**





# Potravinový odpad

ako súčasť komunálnych odpadov.

## Koľko potravín vlastne vyhodíme ?

### Čechům nedochází, jak plýtvají potravinami. Vyhodí 33 kilogramů za rok

© 24. října 2022 15:04

Lidé v Česku si sami neuvědomují, jaké množství potravin vyhazují. Během pondělní konference o potravinovém odpadu na to upozornila Lea Kubíčková z Mendelovy univerzity v Brně. Podle jejího průzkumu vyhodil vloni průměrný Čech 33 kilogramů potravin, respondenti sami ovšem odhadovali, že vyhodili méně než poloviční množství.



### Nevyhazování jídla je sebeklam. Vyhodíme ho třetinu

Plýtvání potravinami je celosvětový problém. Řešení je přitom snadné, stačí začít u sebe

## Odpad z kuchyní by mohl vytápět desetitisíce domácností. V Česku ale zbytečně končí na skládkách

# Potravinový odpad ako súčasť komunálnych odpadov.

## Koľko potravín vlastne vyhodíme ?

### BIOECONOMY ADAPTATION TO CLIMATE CHANGE: A CASE STUDY OF FOOD WASTE IN SLOVAKIA

Ema Lazorčáková\*, Miroslava Rajčániová

Slovak University of Agriculture in Nitra, Slovakia

BBI and ZWE (2020) estimate that annually 84.40 kg of kitchen waste per inhabitant are produced in Slovakia and only 7.89 kg per inhabitant are separated and collected. The total production of biological kitchen waste then amounts to 460 thousand tons per year, thereof 43 thousand tons are collected, but the potential could be up to 391 thousand tons. The difference,

The magistrate of Bratislava estimates the production of biological kitchen waste up to 120 kg per inhabitant. If all this waste were collected and used for the production of compost, it would be possible to obtain 16 thousand tons of compost per year, which could enrich 534 ha of soil (City of Bratislava,

# Potravinový odpad ako súčasť komunálnych odpadov.



**Ministerstvo životného prostredia SR**

**Inštitút environmentálnej politiky**



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**Kuchynský bioodpad tvorí v priemere 20% zmesového komunálneho odpadu.**

Podľa analýz zloženia odpadu spoločností INCIEN a JRK sa v zmesovom komunálnom odpade z domácností nachádza približne **20%** kuchynského bioodpadu, pričom v bytových domoch je to až **34%**. (1.12.2020)

ŠU SR - ODPADY 2022: Ø Komunálne odpady = **478 kg/obyv.** (362 – 641 kg/obyv.)

≈ kuchynský bioodpad => **75 kg/obyv. až 128 kg/obyv.**



# Potravinový odpad ako súčasť komunálnych odpadov.

## Koľko potravín vlastne vyhodíme ?

SPRÁVA O STAVE  
ŽIVOTNÉHO PROSTREDIA  
SLOVENSKEJ REPUBLIKY  
V ROKU 2022



Tabuľka 044 | Vytriedený biologicky rozložiteľný komunálny odpad (bez papiera a lepenky) (2022) (t)

Kód odpadu	Odpad	Množstvo BRKO
20 01 08	Biologicky rozložiteľný kuchynský a reštauračný odpad	51 818
20 01 25	Jedlé oleje a tuky	2 128
20 01 38	Drevo iné ako uvedené v 20 01 37 (20 01 37 - drevo obsahujúce nebezpečné látky)	50 679
20 02 01	Biologicky rozložiteľný odpad	334 666

Zdroj: MŽP SR, SOH



## Dáta o vyzbieranom odpade **20 01 08** za rok 2022 na celom Slovensku

**Výberová štatistika** ↓ (> 8,0 t/r)

vstup: 300 miest a obcí – Ext. = **292 obcí (10,1%)**

celkom obyvateľov: **2 285 300 (42,1%)**

celkom odpadu: **31 267 t (60,3%)**

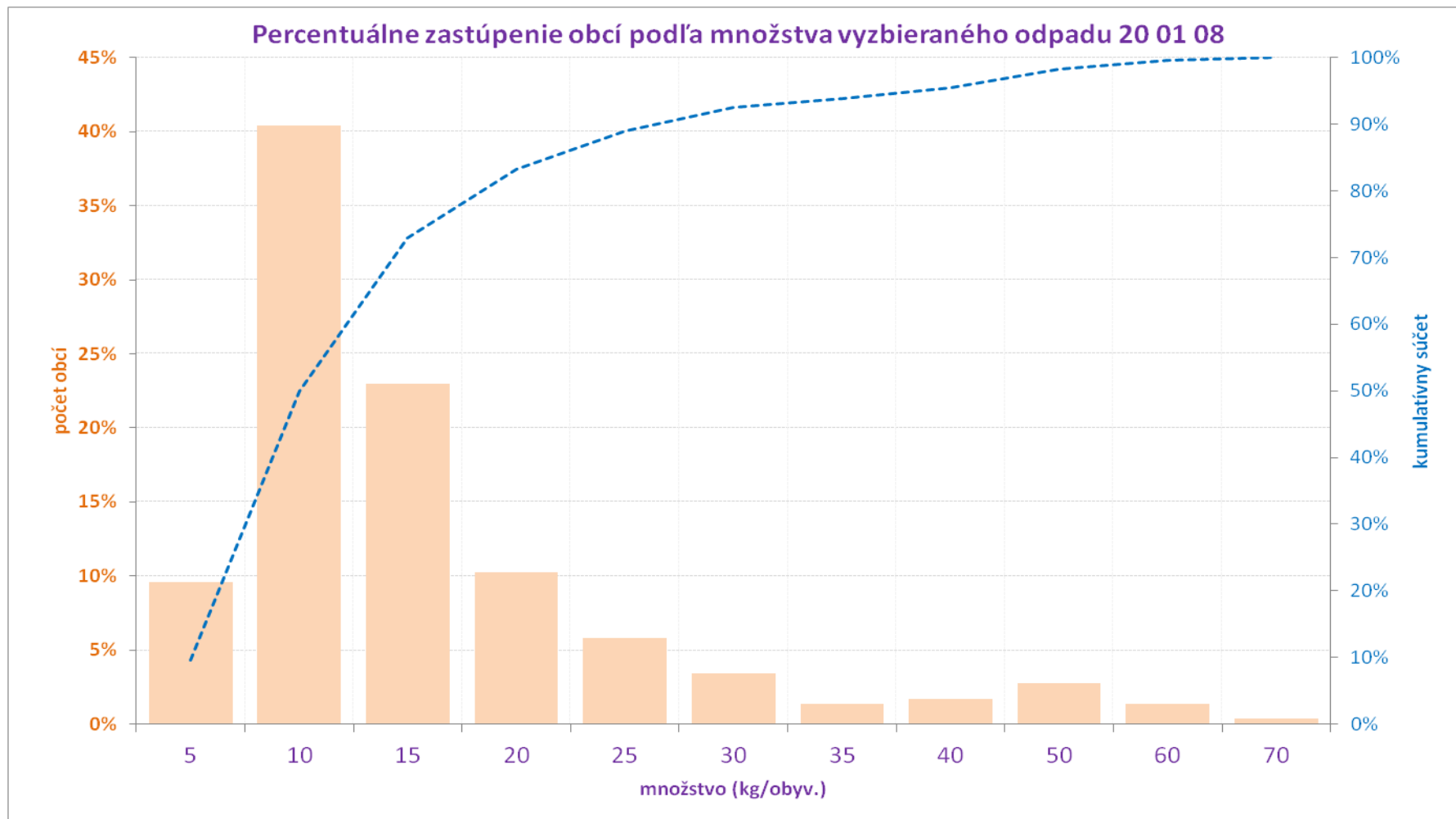
**Aritmetický priemer = 13,6 kg/obyv.**

**Medián = 10,0 kg/obyv.**

ŠU SR:  
Slovensko = **5 428 792 obyvateľov**  
2 890 obcí z toho 141 miest  
412 obcí < 200 obyvateľov  
až 67% obcí < 1 000 obyvateľov !  
len 16% obyvateľov žije v obciach < 1 000 obyvateľov

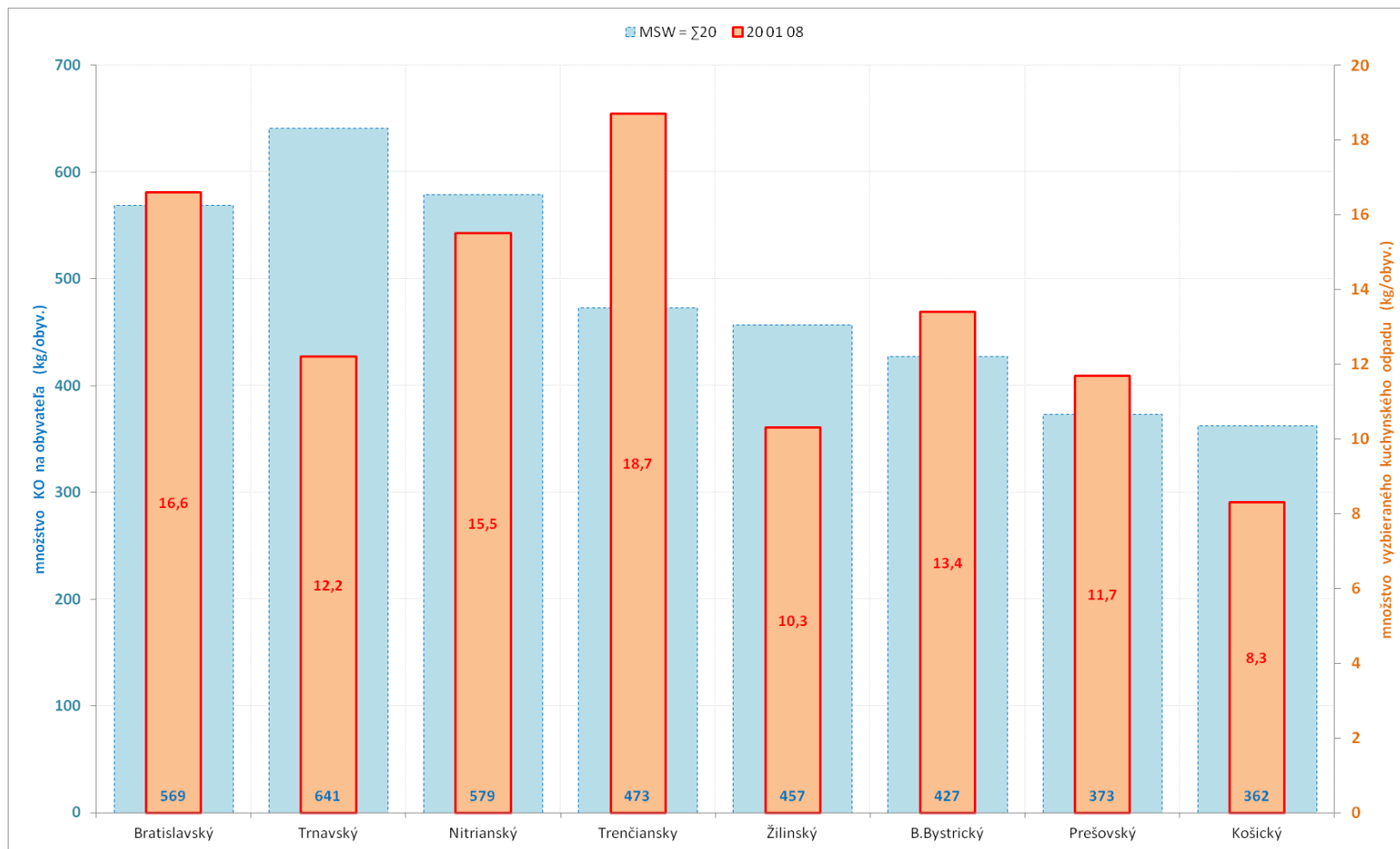
MŽP SR :  
20 01 08 = **51 848 t**

ŠU SR + MŽP SR :  
51 848 t / 5 428 792 obyv.  
**Ø = 9,55 kg/obyv.**



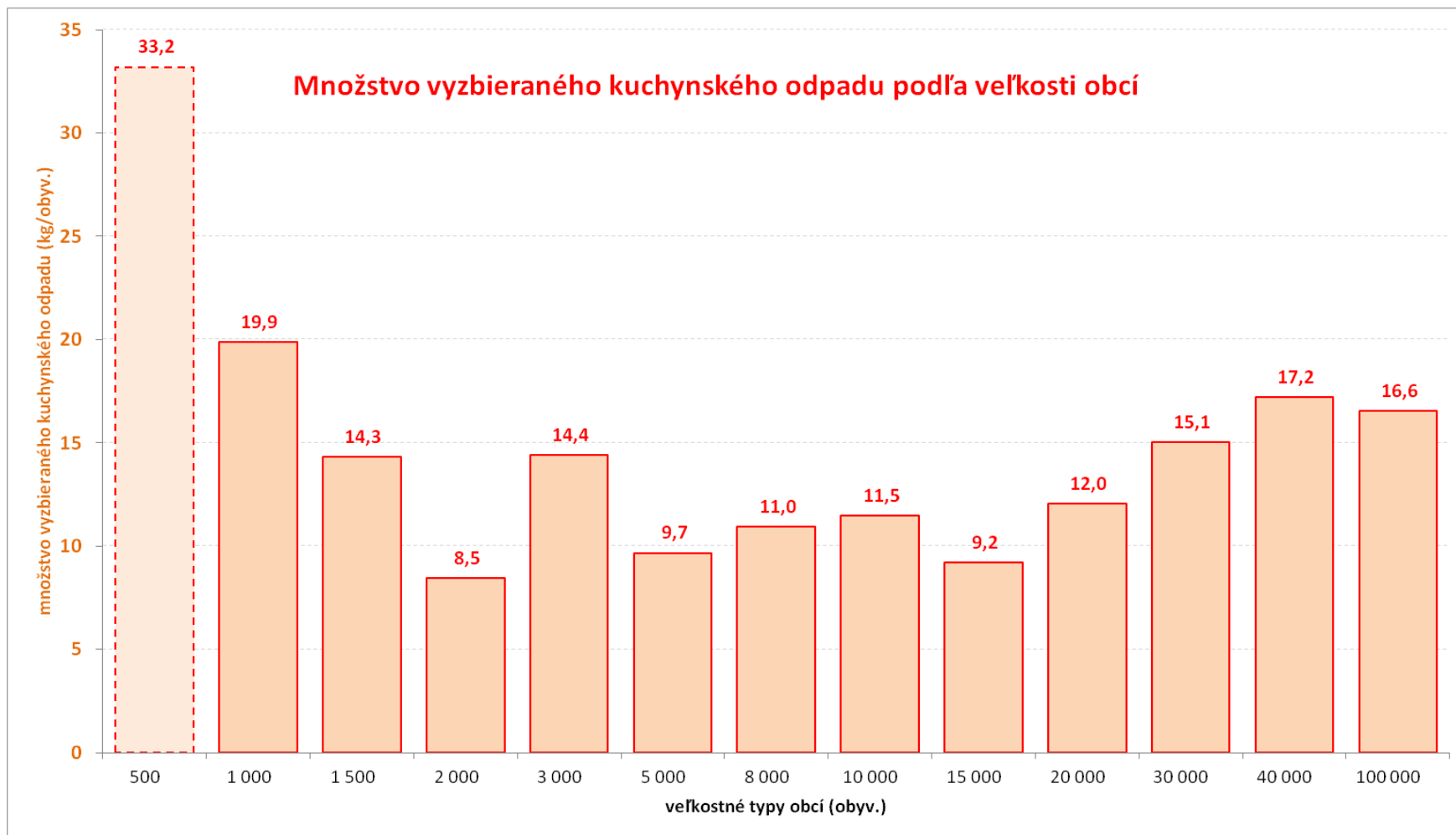
• Obrázok č. 1: Graf distribúcie množstva vyzbieraného odpadu 20 01 08





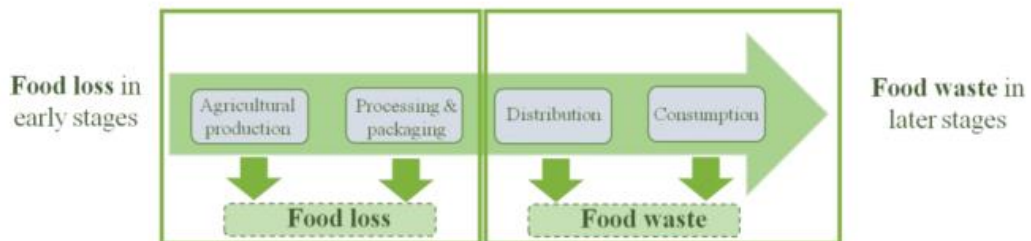
• Obrázok č. 2: Produkcia MSW a množstvo odpadu 20 01 08





• Obrázok č. 3: Množstvo vyzbieraného odpadu 20 01 08 podľa veľkosti obcí

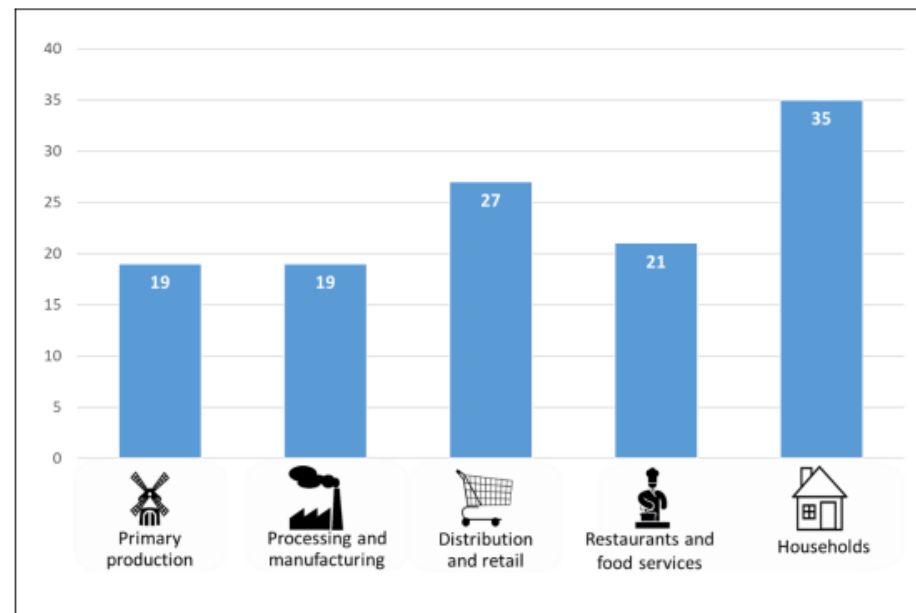
# Potravinový odpad - definícia



## Food waste

Household food waste

Edible food and drink fractions from products or meals that are acquired with the intention to be consumed by humans, but remain unconsumed and are discarded. This concerns food and drink products that are prepared, stored, and/or in part consumed in the household.



# Potravinový odpad - definícia

## 3.1 Food waste definition

Study code	Food waste definition	Edible / Inedible*	Avoidable/ Unavoidable**
AT_1	<b>Food waste:</b> all food and drinks wasted in kitchen operations (including storage and preparation losses) and at consumption (unserved food, buffet remains and plate leftovers).	Edible + Inedible (separate figures)	Differentiated
AT_2	<b>Food losses</b> (at retail stage): unsold food products and products returned to suppliers.	Edible + Inedible (combined)	Not differentiated
BE_1	<b>Food loss:</b> food commodity or a product designated for human food consumption that is ultimately not consumed by people <b>Food waste:</b> edible fraction of food commodities or products (in the form of food loss) or the inedible fraction of food commodities or products (in the form of residues) that disappear from the agri-food chain aimed at human food (i.e. they are given a non-human destination). Waste flows released during primary production before the crops are ready for harvest or the animals are ready for slaughter are not part of the agri-food chain and therefore fall outside the definition of 'food waste'.	Edible + Inedible (separate figures)	Not differentiated
BE_2	<b>Food losses:</b> food products that eventually are not used for human consumption and are applied back to land, used as animal feed, composted, anaerobic digested or simply not harvested.	Edible + Inedible (combined figures)	Not differentiated
BE_3	<b>Food loss:</b> edible food and drink fractions from products or meals that are acquired with the intention to be consumed by humans but remain unconsumed and are discarded.	Edible	Not mentioned
CZ_1	<b>Food waste (including food loss):</b> refers to food as well as associated inedible parts removed from the food supply chain. That means they are not used for normal human consumption.	Edible + Inedible (combined figures)	Not differentiated
DE_1	<b>Food losses:</b> parts of a food product that are not eaten, including raw products (i.e., those that are not harvested) as well as losses in food processing or food waste in households.	Edible + Inedible (combined figures)	Not differentiated
DE_2	<b>Food waste:</b> food residues from agricultural production, processing of food, wholesale and retail, kitchens of large consumers, private households. Raw and processed food fit for human consumption.	Edible + Inedible (combined figures)	Differentiated
EE_1	<b>Food lost or wasted:</b> food originally intended for human consumption, which, for whatever reason, is not consumed by humans (e.g. spoiled, overdue, improper storage and handling).	Edible + Inedible (separate figures)	Differentiated
EE_2	<b>Food loss:</b> unprocessed or processed food that was originally intended for human consumption, but for one reason or another, it was not consumed (e.g. composted, used for on bioenergy production, as animal feed).	Edible	Not mentioned
EE_3	<b>Food waste:</b> food (including inedible parts) leaving the FSC, excluding food used as material (e.g. for the production of bio-based products and animal feed), or redistributed (e.g. food donation). <b>Food loss:</b> any food or food product originally intended for human consumption which has been removed from the FSC for economic or aesthetic reasons, or because of the overrun of the consumption period, but which is still edible and fit for human consumption.	Edible + inedible (combined figures)	Not mentioned



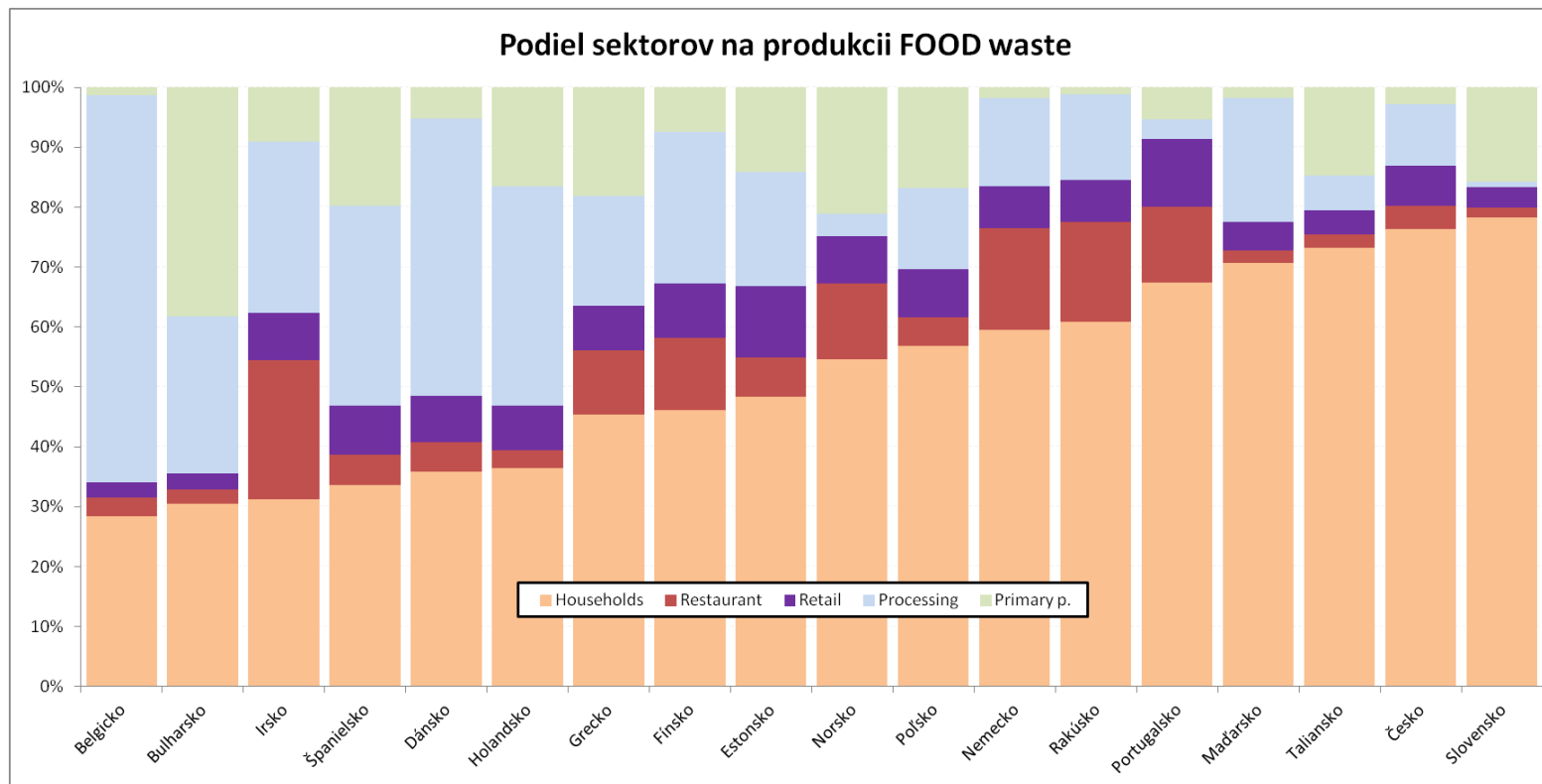
2019

Review of studies on food waste accounting at Member State level





## Review of studies on food waste accounting at Member State level



# Potravinový odpad - údaje

**Amount and Causes of Food Waste in Households from Perspective of Consumers – the Case Study of the Czech Republic**

Radka HANZLOVÁ  
 Sociologický ústav AV ČR, v. v. i., Jilská 1, 110 00 Praha 1,

**Table 1: Accuracy and reliability of the food waste measurement methods suggested by the European Commission (\*\* = high, \*\* = medium)**

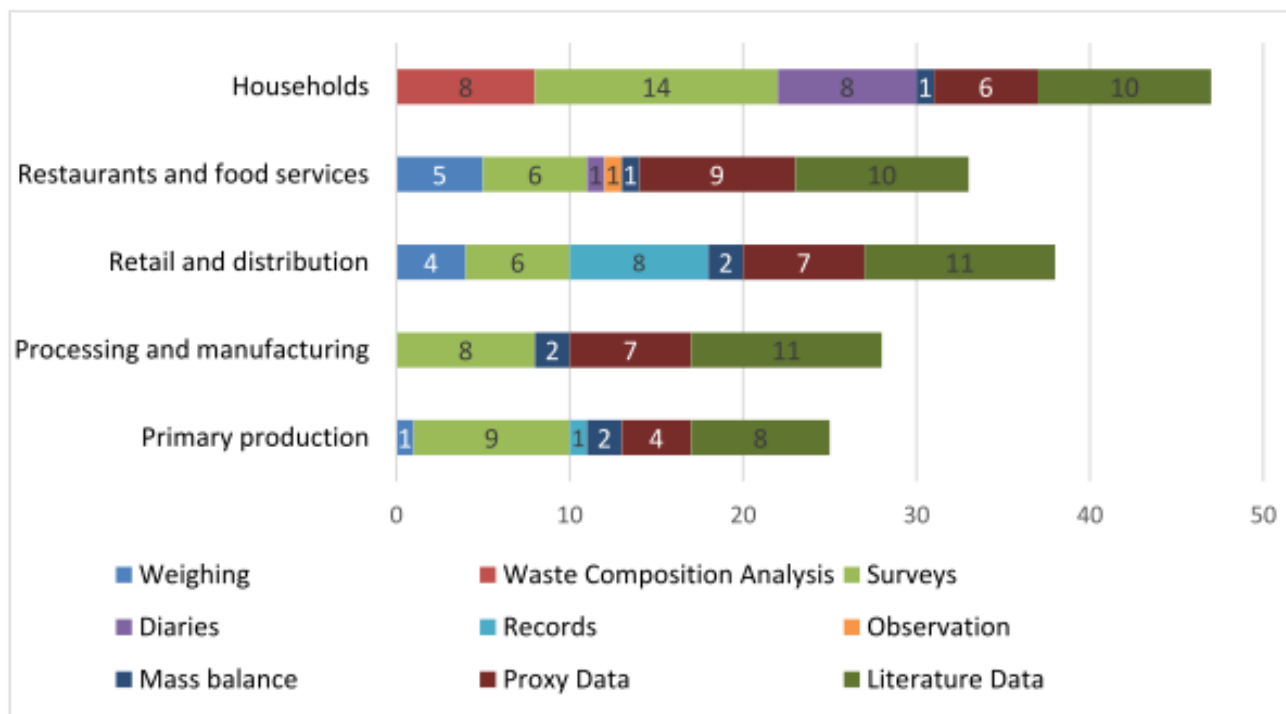
Food Supply Chain Stage	Food Waste Measurement Methods					
Primary production	Direct measurement (weighting or volumetric) ***	Questionnaires and interviews **	Mass balance **	Waste composition analysis ***	Coefficients and production statistics **	
Processing and manufacturing					Counting/ scanning **	Diaries **
Retail and food distribution						
Restaurants and food services						
Households						

*Note: Direct methods are in the green cells; indirect methods are in the blue cells; and the yellow cells include direct and indirect methods.*



# Potravinový odpad - údaje

**Figure 5.** Food waste quantification methods used by the studies analysed for each stage of the FSC.



Review of studies on food waste accounting at Member State level

2019



# Potravinový odpad - údaje ???

## Missing Food, Missing Data? A Critical Review of Global Food Losses and Food Waste Data

Li Xue,<sup>†,‡</sup> Gang Liu,<sup>\*,§</sup> Julian Parfitt,<sup>||</sup> Xiaojie Liu,<sup>†</sup> Erica Van Herpen,<sup>⊥</sup> Åsa Stenmarck,<sup>#</sup> Clementine O'Connor,<sup>@</sup> Karin Östergren,<sup>∇</sup> and Shengkui Cheng<sup>†</sup>

<sup>†</sup>Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences, 100101 Beijing, China

<sup>‡</sup>University of Chinese Academy of Sciences, 100049 Beijing, China

<sup>§</sup>SDU Life Cycle Engineering, Department of Chemical Engineering, Biotechnology, and Environmental Technology, University of Southern Denmark, 5230 Odense, Denmark

<sup>||</sup>Anthesis Group, Oxford OX4 1RE, United Kingdom

<sup>⊥</sup>Marketing and Consumer Behavior Group, Wageningen University, Wageningen 6708 PB, The Netherlands

<sup>#</sup>IVL Swedish Environmental Research Institute, 114 27 Stockholm, Sweden

<sup>@</sup>World Resources Institute, Washington, DC 20002, United States

<sup>∇</sup>RISE Bioscience and Materials, Agrifood and Bioscience, 223 70 Lund, Sweden

## Food waste measurement toward a fair, healthy and environmental-friendly food system: a critical review

Vera Amicarelli and Christian Bux

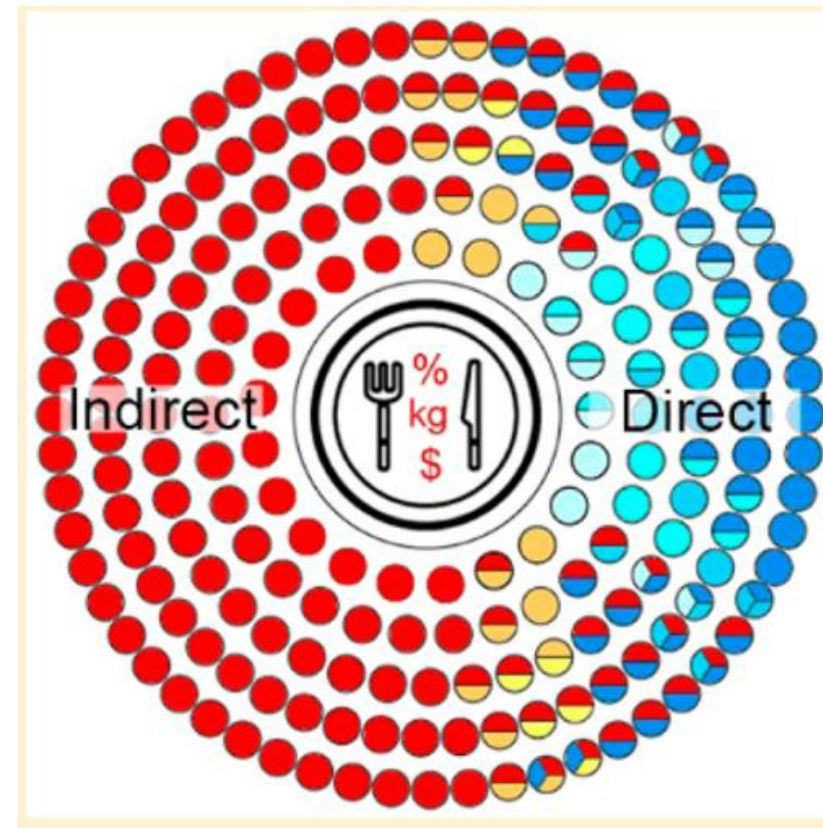
*Department of Economics, Management and Business Law, University of Bari, Bari, Italy*

A critical review on food loss and waste quantification approaches: Is there a need to develop alternatives beyond the currently widespread pathways?

Daniel Hoehn<sup>a</sup>, Ian Vázquez-Rowe<sup>b</sup>, Ramzy Kahhat<sup>b</sup>, María Margallo<sup>a</sup>, Jara Laso<sup>a</sup>, Ana Fernández-Ríos<sup>a</sup>, Israel Ruiz-Salmón<sup>a</sup>, Rubén Aldaco<sup>a,\*</sup>

<sup>a</sup> DEPROs Group, Department of Chemical and Biomolecular Engineering, University of Cantabria, Spain

<sup>b</sup> Peruvian LCA & Industrial Ecology Network (PELCAN), Department of Engineering, Pontificia Universidad Católica del Perú, Avenida Universitaria 1801, San Miguel 15088, Lima, Perú



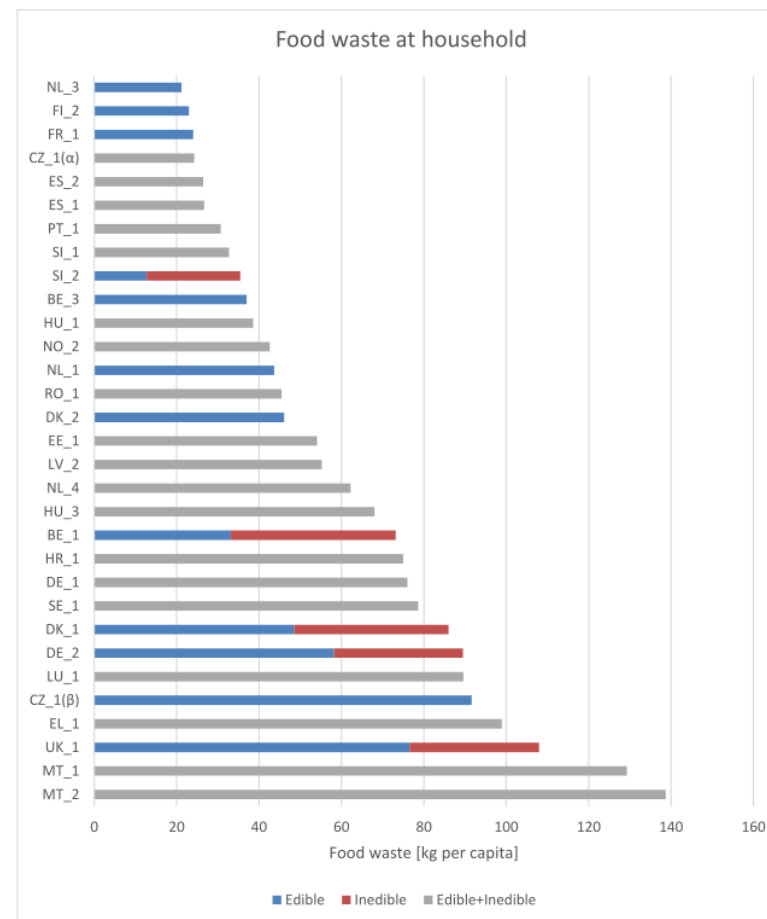


# Potravinový odpad (kg/obyv.)

**Table 13.** Food waste quantified in the studies carried out by Bräutigam et al. (2014), and Monier et al (2010).

Country	Bräutigam et al. (2014)		Monier et al (2010)	
	Total figures (1.000 tonnes)	Kg per capita	Total figures (1.000 tonnes)	Kg per capita
AT	2,276	275	1,858	225
BE	3,222	304	4,192	399
BG	1,638	215	674	87
CY	256	245	256	334
CZ	1,941	189	729	71
DE	18,671	223	10,387	125
DK	1,868	343	642	118
EE	303	230	355	264
EL	4,838	438	488	44
ES	16,494	374	7,696	176
FI	1,196	227	1,013	192
FR	18,500	299	9,078	144
HR				
HU	2,723	270	1,858	184
IE	1,189	281	1,051	250
IT	19,696	333	8,778	149
LT	881	272	581	171
LU	101	217	97	205
LV	572	261	216	94
MT	102	245	25	63
NL	6,495	397	9,456	580
PL	12,116	317	8,972	235
PT	3,238	307	1,391	131
RO	7,261	329	2,274	105
SE	2,075	228	2,053	226
SI	473	236	179	90
SK	943	175	589	109
UK	13,669	225	14,391	280

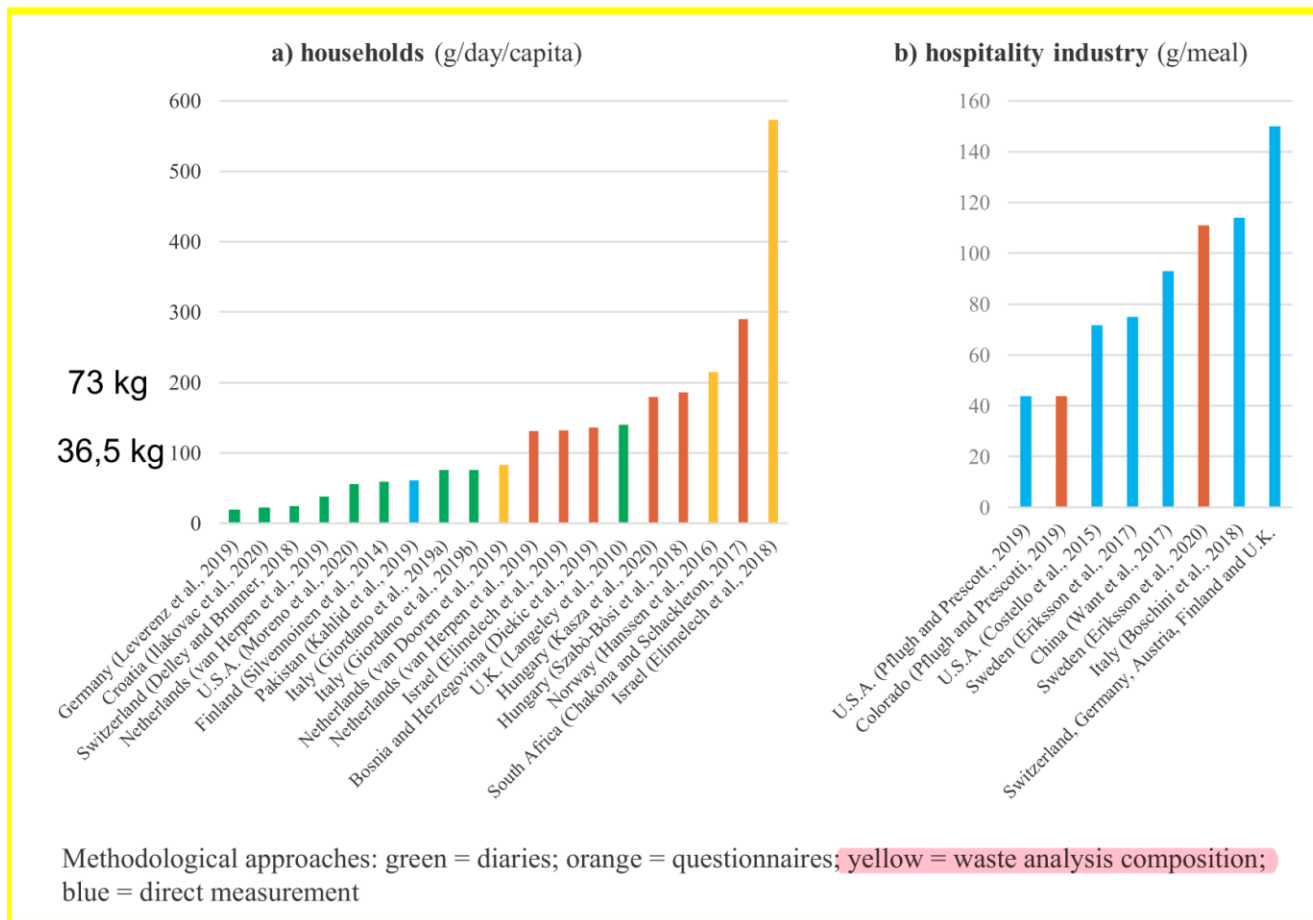
**Figure 10:** Food waste at household level [kg per capita per year].



# Potravinový odpad (kg/obyv.)

## Food waste measurement toward a fair, healthy and environmental-friendly food system: a critical review

Vera Amicarelli and Christian Bux  
 Department of Economics, Management and Business Law, University of Bari,  
 Bari, Italy



# Potravinový odpad (kg/obyv.)

Food waste amount, type, and climate impact in urban and suburban regions in Finnish households

Kirsi Silvennoinen\*, Sampsa Nisonen, Juha-Matti Katajajuuri

Journal of Cleaner Production 378 (2022) 134430

Amount of food waste in different types of housing and total kg/cap/y. IFW = originally inedible food waste, EFW = originally edible food waste.

Type of house/kg/cap/y	IFW in mixed waste	IFW in separately collected biowaste	IFW Total	EFW in mixed waste	EFW in separately collected biowaste	EFW Total	Total FW
<b>Type 1 Houses without separately collected biowaste</b>							
Helsinki 2015	27.2	-	27.2	24.2	-	24.2	51.4
Helsinki 2018	21.9	-	21.9	25.4	-	25.4	47.3
Tampere 2016	39.5	-	39.5	26.8	-	26.8	66.4
Turku 2019	35.7	-	35.7	25.2	-	25.2	60.9
<b>Type 2 Houses with separately collected biowaste</b>							
Helsinki 2015	19.2	13.0	32.2	18.0	4.7	22.7	54.9
Helsinki 2018	16.9	13.1	30	19.7	4.9	24.6	54.6
Tampere 2016	14.7	17.1	31.8	16.7	12.3	29.0	60.7
Turku 2019	11.5	17.3	28.8	13.0	6.8	19.8	48.7
<b>Total on average</b>							
Helsinki 2015	21.1	10.0	31.1	19.4	3.6	23.0	54.1
Helsinki 2018	18.0	10.2	28.2	21.0	3.8	24.8	53.0
Tampere 2016	20.9	12.8	33.7	19.2	9.2	28.4	62.1
Turku 2019	26.4	6.7	33.1	20.5	2.6	23.1	56.2

• Ø = 22,2 kg/obyv.



## Potravinový odpad (kg/obyv.)

Food waste amount, type, and climate impact in urban and suburban regions in Finnish households

Kirsi Silvennoinen\*, Sampsa Nisonen, Juha-Matti Katajajuuri

Journal of Cleaner Production 378 (2022) 134430

Compared with European household FW studies, our results for FW 53.0–62.1 kg/cap/y, were somewhat lower than in Britain, at 69 kg/cap/y (WRAP, 2020), Sweden, at 95 kg/cap/y – or 69 kg/cap/y without liquids (Naturvårdsverket, 2020), Norway, at 81 kg/cap/y (Hanssen et al., 2016), or the European average at 92 kg/cap/y – or 71 kg/cap/y without liquids (Stenmarck et al., 2016). Similar FW amounts have resulted from Germany, at about 60 kg/cap/y (Leverenz et al., 2021) and the Netherlands, at 41–48 kg/cap/y (van Dooren et al., 2019). An examination of the results from other WCA studies shows great variation, with amounts from 43 kg/cap/y to 129 kg/cap/y, and with FW definitions and monitoring methods (Caldeira et al., 2019), which is why the studies are probably mostly incomparable. In any case, this study and the previous diary study (Silvennoinen et al., 2014) showed quite similar EFW amounts in Finnish households.



# Potravinový odpad (kg/obyv.)

**Table 3.** Food waste in Germany 2015 in metric tonnes of fresh mass. Summary of results for different sectors of the food supply chain according to Delegated Decision 2019/1597.

	Mio. t	Food Waste		Theoretically Avoidable Parts		
		kg/(cap-year)	Share	Mio. t	kg/(cap-year)	Share
Primary production	1.4 ± 0.5	16.6 ± 6.0	≈12%	1.2 ± 0.4	14.2 ± 4.4	≈18%
Processing and manufacturing	2.2 ± 0.8	26.4 ± 9.1	≈18%	1.2 ± 0.4	14.5 ± 5.0	≈18%
Retail and other distribution of food *	0.5 ± 0.2	6.1 ± 1.9	≈4%	0.4 ± 0.1	5.1 ± 1.6	≈6%
Restaurants and food services	1.6 ± 0.3	19.9 ± 3.4	≈14%	1.1 ± 0.2	13.1 ± 2.9	≈17%
<b>Households (excluding sewers)</b>	6.2 ± 0.6	<b>75.2 ± 7.7</b>	≈52%	2.7 ± 0.3	<b>33.1 ± 3.9</b>	≈41%
∑ Food waste in Germany	11.9 ± 2.4	144.2 ± 28.1	100%	6.6 ± 1.4	80.0 ± 17.8	100%

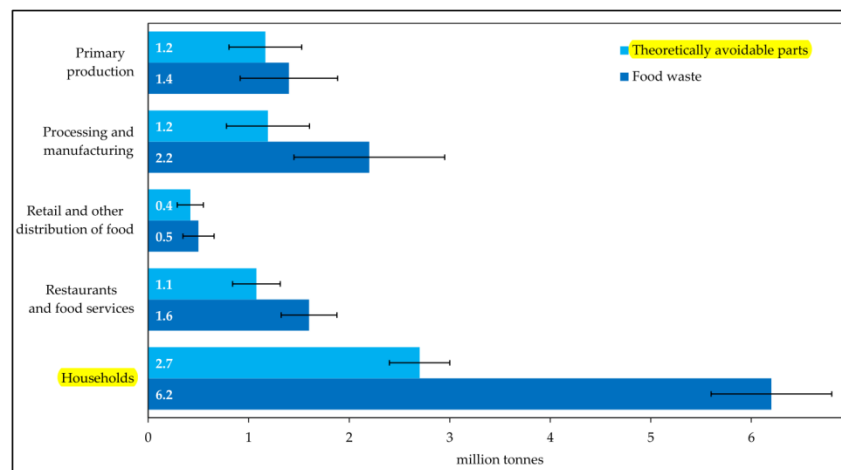
\* including wholesale markets.

## Food Waste Generation in Germany in the Scope of Euro Legal Requirements for Monitoring and Reporting

Dominik Leverenz <sup>1,\*</sup>, Felicitas Schneider <sup>2</sup>, Thomas Schmidt <sup>2</sup>, Gerold Hafner <sup>1</sup>, Zuemmy Nevárez <sup>1</sup> and Martin Kranert <sup>1</sup>

Sustainability 2021, 13, 6616. <https://doi.org/10.3390/su13126616>

www.sn-cz2027.eu



**Figure 5.** Food waste quantities and its avoidable parts in Germany for the reference year 2015 in million metric tonnes of fresh mass (excluding sewers).



# Potravinový odpad (kg/obyv.)

WASTE FORUM 2023, číslo 3,

## Množství a příčiny potravinového odpadu v domácnostech z pohledu spotřebitelů – případová studie České republiky

**Radka HANZLOVÁ**

Sociologický ústav AV ČR, v. v. i., Jilská 1, 110 00 Praha

*Výsledky ukázaly, že český spotřebitel průměrně vyhodí 0,566 kg potravinového odpadu týdně, což v přepočtu vychází 29,4 kg za rok. Lidé nejčastěji vyhazují chléb a pečivo, hotová jídla a čerstvé ovoce. Z hlediska příčin plýtvání potravinami, mezi hlavní patří nekonzumovatelné zbytky, zkažené či prošlé potraviny, že lidé na jídlo zapomenou nebo že ho příliš mnoho uvaří a také překročení data trvanlivosti a spotřeby. Naopak hlavním motivem lidí, proč potravinami neplýtvat, je jednoznačně finanční úspora.*

# Potravinový odpad (kg/obyv.)



**Publisher:**  
 Institute of Environmental Protection - National Research Institute,  
 02-170 Warszawa, Słowicza Street 32

Warsaw 2024

country:	Poľsko	Poľsko	Poľsko	Poľsko	Poľsko	Poľsko	Norsko	Belgicko	Holandsko	Portugalsko	
city:	Kutno	Komorniki	Biała Podlaska	Luków	Konstancin-Jeziorna	Bielsko-Biala	Drammen	Brussels	Ommen	Lipor	
inhabitants :	41 231	36 329	54 768	27 453	25 151	166 776	102 273	1 222 637	18 457	974 386	
Σ "kitchen waste" (t) :	5 092	3 551	5 699	5 092	4 913	13 777	5 446	5 261	2 838	26 981	
Σ "BRO green" (t) :	2 634		3 621	2 634		6 370	10 114	14 316		24 928	
Amount 1 resident K_w (kg) :	124	98	104	185	195	83	53	4	154	28	
Amount 1 resident Green_w (kg) :	64		66	96		38	99	12		26	
BRO all (kitchen + green) (kg/in) :	187	98	170	281	195	121	152	16	154	53	
Fees for residents :	78 €	94 €	46 €	54 €	97 €	70 €	257 €	real estate tax	203 €	water used fee	
Economy:	DEFICIT	SURPLUS	DEFICIT	DEFICIT	DEFICIT	DEFICIT	DEFICIT	SURPLUS	SURPLUS	DEFICIT	
Economy (EUR):	- 366 136 €	271 718 €	- 371 242 €	- 95 920 €	?	?	- 931 641 €	???	5 673 000 €	- 5 305 206 €	
Cost per 1,0 t collect. w. :	178 €	368 €	101 €	221 €	183 €	192 €	246 €	748 €	245 €	113 €	
	Ø = 207 EUR										



## Potravinový odpad (kg/obyv.)

### THE CATALOGUE OF GOOD PRACTICES IN THE COLLECTION OF BIO-WASTE



**Publisher:**

Institute of Environmental Protection - National Research Institute,  
02-170 Warszawa, Slowicza Street 32

Warsaw 2024

#### Fractions of selectively collected municipal waste

It's separated into 7 fractions:

- paper
- container glass
- metals, plastics and multi-material packaging waste
- ash
- **biodegradable waste "Bio-waste"**, i.e.: cut branches of trees and shrubs, cut grass, leaves, flowers, sawdust and tree bark, flowers along with flower soil
- **biodegradable kitchen waste "Wet fraction"**, i.e.: vegetable and fruit waste (including peelings, etc.), food scraps, used paper towels and tissues, disposable nappies and other personal hygiene products, animal bones and leftovers from domestic animals
- mixed waste

#### Fractions of selectively collected municipal waste

It's separated into 7 fractions:

- glass
- paper
- metals and plastics
- ash
- **biodegradable kitchen waste "Bio"**, i.e.: kitchen waste, leftovers from meals; fruit and vegetable scraps and peelings; coffee and tea grounds; eggshells; potted plants, balcony plants; cut flowers and flower soil from pots; greased paper and cardboard (e.g. soiled with organic residues and mould, soaked packaging or parts thereof, e.g. white cheese paper, kitchen towels); used greased paper bags and pouches; paper kitchen towels and napkins; live Christmas trees without ornaments and pots
- **biodegradable waste "Green waste"**, i.e.: bulkier garden waste
- mixed waste

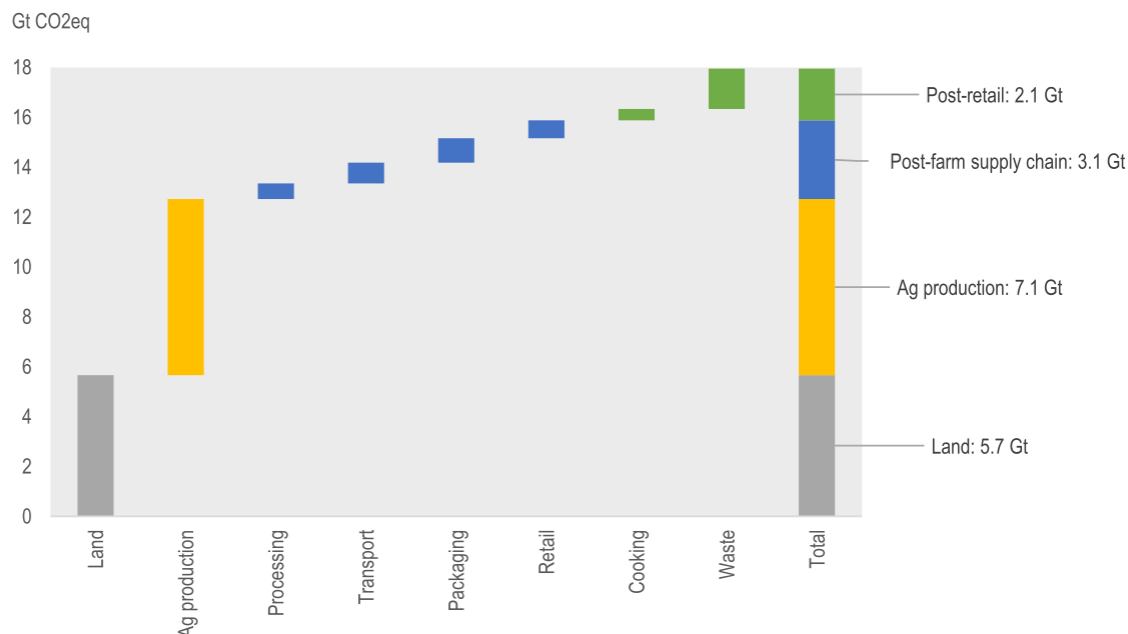
• 1. otázka: redukcia GHG

# OVERCOMING EVIDENCE GAPS ON FOOD SYSTEMS

OECD FOOD, AGRICULTURE AND FISHERIES  
PAPER  
July 2023 n°199

OECD publishing

Figure 4. Food systems GHG emissions by supply chain stage, 2015



Source: Crippa et al. (2021<sub>[107]</sub>), using the mapping developed by Ritchie (2021<sub>[109]</sub>).





- **1. otázka: redukcia GHG**



## Ex-Post Analysis of the Impact of National Landfill Policy for Greenhouse Gas Emissions in the Waste Sector



March 2021

### Executive Summary

#### Patterns and Trends in Municipal Solid Waste Landfilled and Associated Methane Emissions

- **Over the past three decades, the quantity of the municipal solid waste landfilled in Ireland has declined by 75.9 per cent**, from 1,925.3 kilo tonnes in 1990 to 463.2 kilo tonnes in 2018. The proportion of municipal solid waste landfilled in the total municipal solid waste stood at 14 per cent in 2018, down from 92 per cent in 1990.

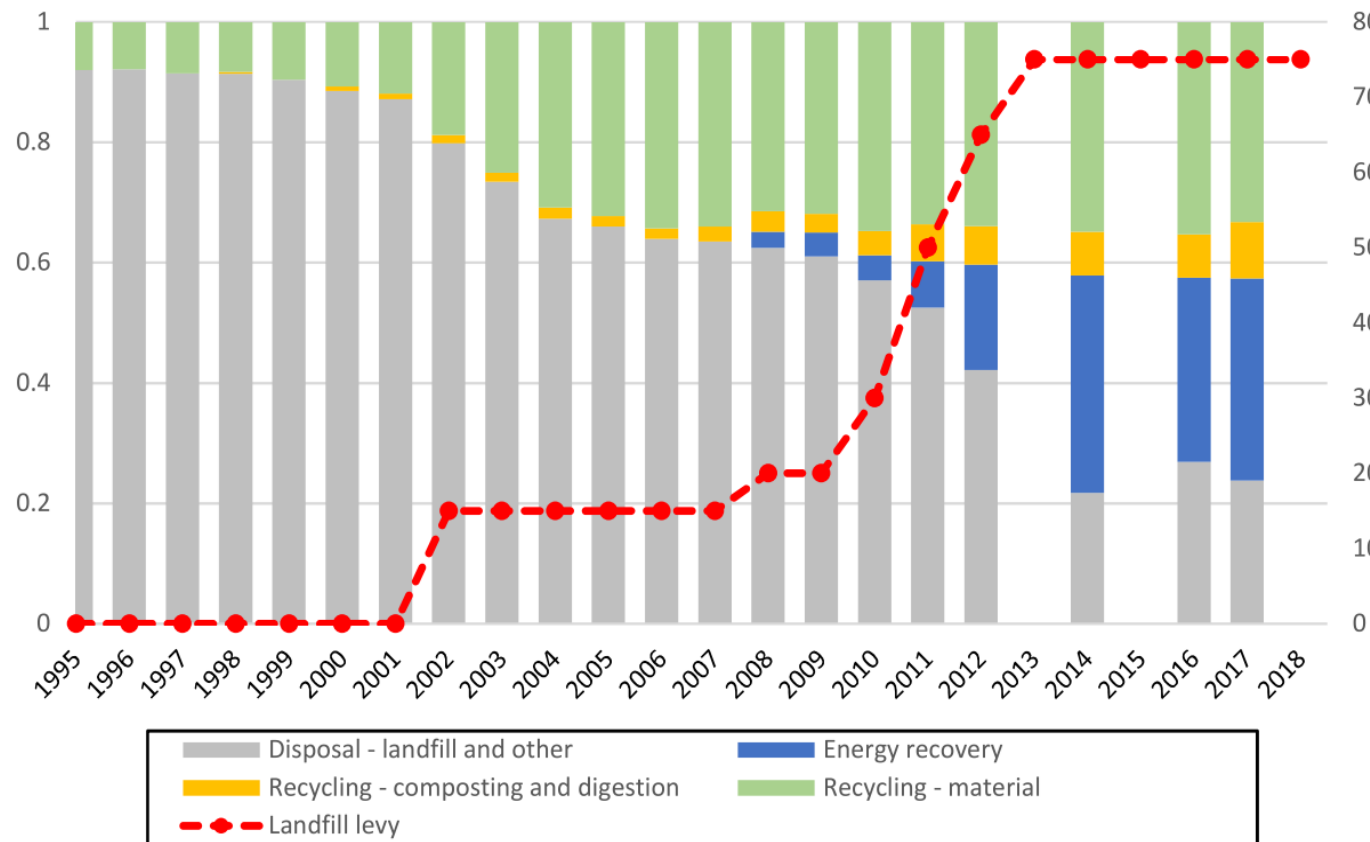
- **In the absence of regulations for food waste disposed to landfill**, assuming that the proportion of food waste disposed to landfill in the municipal solid waste would have remained as in 2009, **the total methane emissions would have been higher by 3.2 per cent** and the net methane emissions would have been higher by 2.2 per cent.

1. otázka: redukcia GHG



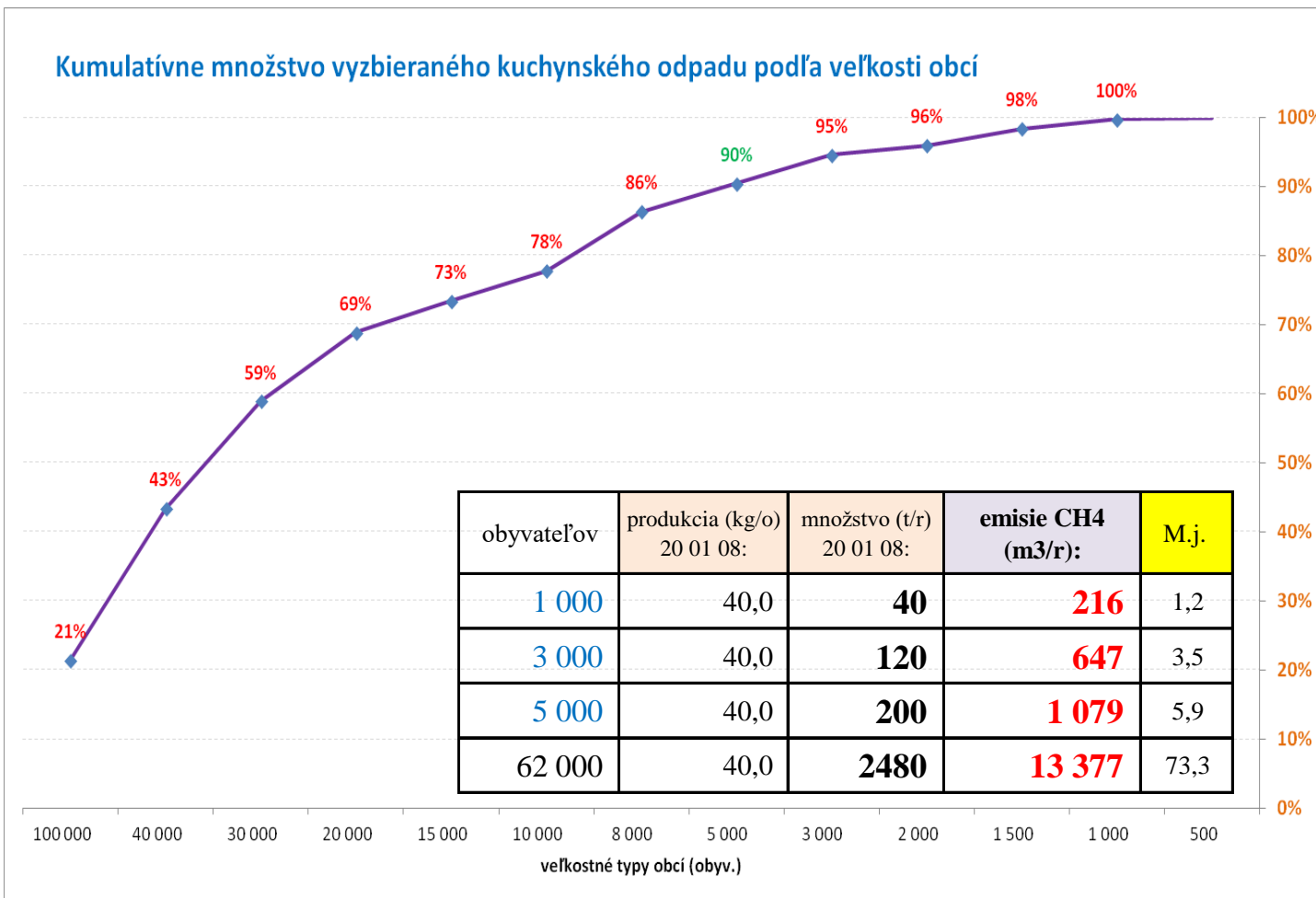
Ex-Post Analysis of the Impact of National Landfill Policy for Greenhouse Gas Emissions in the Waste Sector

Fig. 11: Municipal solid waste treated in Ireland by method and the landfill levy, 1995-2018



• **2. otázka: Efektivita zberu a GHG emisie**

Kumulatívne množstvo vyzbieraného kuchynského odpadu podľa veľkosti obcí



ŠU SR:  
 Slovensko = 5 428 792 obyv.  
 2 890 obcí z toho 141 miest

- 90%:  
 ➤ 5 000 obyv. = 135 miest
- 95%  
 ➤ 3 000 obyv. = 286 m.+ o.



Intergovernmental Panel on Climate Change



2006 IPCC Guidelines for  
 National Greenhouse Gas Inventories

$$G_{CH_4} = \sum_{x=S}^{T-1} \{W_x \times MCF \times DOC \times DOC_F \times F \times \frac{16}{12} \times (e^{-k(T-x-1)} - e^{-k(T-x)})\}$$

where:

- $G_{CH_4}$  = Modeled methane generation rate in reporting year T (metric tons CH<sub>4</sub>).
- x = Year in which waste was disposed.
- S = Start year of calculation.
- T = Reporting year for which emissions are calculated.
- $W_x$  = Quantity of waste disposed in the landfill in year x (metric tons).
- MCF = Methane correction factor; default value = 1.
- DOC = Degradable organic carbon (metric tons C/metric ton waste).
- $DOC_F$  = Fraction of DOC dissimilated; default value = 0.5.
- F = Fraction by volume of CH<sub>4</sub> in landfill gas; default is 0.5.
- k = Rate constant.



• **3. Prínos energie**

**Energia z odpadov 20 01 08**

•  $Q = 180 \text{ Nm}^3/\text{t}$     $\text{CH}_4 = 50\%$     $\text{N}_e = 35\%$

		Reálne vyzbierané množstvo (15 kg/o.)	Anaerobna digescia	Cieľové vyzbierané množstvo (42 kg/o.)	Anaerobna digescia
krajské mesta:	rok:	20 01 08 (t):	El. energia (MWh)	20 01 08 (t):	El. energia (MWh)
<b>Bratislava</b>	2023	8 499	<b>2 490</b>	18 480	<b>5 414</b>
<b>Košice</b>	2023	2 431	<b>712</b>	10 080	<b>2 953</b>
<b>Trenčín</b>	2023	2 244	<b>657</b>	2 272	<b>666</b>
Banská Bystrica	2023	1 335	<b>391</b>	3 133	<b>918</b>
Prešov	2023	1 014	<b>297</b>	3 822	<b>1 123</b>
Nitra	2023	954	<b>279</b>	3 234	<b>947</b>
Trnava	2023	890	<b>261</b>	2 646	<b>775</b>
<b>Žilina</b>	2023	312	<b>91</b>	3 402	<b>997</b>
<b>SPOLU:</b>		<b>17 679</b>	<b>5 178</b>	<b>47 069</b>	<b>13 793</b>
priemerný okres	62 000 obyv.	831	<b>243</b>	2 604	<b>763</b>



• 3. Prínos energie

Energia z odpadov 20 01 08

Odpad z kuchyní by mohl vytápět desetitisíce domácností. V Česku ale zbytečně končí na skládkách



SÚHRNNÁ  
 SPRÁVA

Bilancia energetickej spotreby domácností



Slovenský hydrometeorologický ústav

	Vyzbierané množstvo odpadu	Vyrobená el. energia	spotreba elektriny RD (MWh/r)			
			20 01 08 (t/r):	(MWh/r):	celkom:	kúrenie:
Krajské mestá (2023)	17 679	5 178	1 227	3 477	0,4%	
Krajské mestá (á 40 kg/o.)	47 069	13 793	3 268	9 262	1,0%	
SR (2022)	51 818	15 180	3 597	10 193	1,2%	
SR (á 40 kg/obyv.)	153 070	44 842	10 625	30 111	3,4%	





# Kuchynské odpady

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