

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,

e-mail: radka.hanzlova@soc.cas.cz

Abstract

Food waste occurs throughout the food distribution chain, with households, i.e., consumers, accounting for the largest share of total food waste. Different methods can be used to determine how much food people waste in their households, with widely varying results. Direct measurement methods prove to be the most accurate, but due to their financial, logistical, and time-consuming nature, they are not very common, and therefore questionnaires based on subjective estimates of respondents are very often used.

This article presents the results of a study that aimed to quantify the amount of food wasted in Czech households through a more sophisticated questionnaire, to identify the most frequently wasted types of food and to explore why people waste food and, conversely, what motivates them to prevent food waste. The analysis is based on a representative sample of the Czech population (N = 815).

The results showed that the average Czech consumer over 15 years old throws away 0.566 kg of food waste per week, which equates to 29.4 kg of food waste per year. Bakery products, ready to eat meals and fresh fruit were the types of food most frequently discarded. Regarding the reasons for wasting food, the main reason was unconsumable leftovers, e.g., scraps and parings, followed by rotten food, forgetting about the food, too much food is cooked, and expired eat-by-dates. On the contrary, the main motive for people not to waste food is clearly saving money.

Keywords: food waste, food waste quantities, causes, questionnaire, consumers, Czech Republic

Introduction

Food waste is a serious problem in the world with social, environmental, ethical, and economic impacts^{1,2,3,4}. According to the Food and Agriculture Organization (FAO), an estimated one-third of the food produced for human nutrition globally is lost or wasted, corresponding to 1.3 billion tonnes of food per year worth approximately 1 trillion dollars⁵. Food losses (FL), which refer to the decrease in edible food for human consumption, occur in the early stages of the food supply chain (FSC) – at the production, post-harvest, and processing stages, while food waste (FW) arises in the later stage of the FSC (retail and final consumption in households) and relates to behavioural issues^{5,6}. In this study, the focus will be only on food waste at the household level, as people in households, in other words, consumers, are producing the most food waste^{6,7,8,9,10}. Individuals have an important role to play in tackling food waste because they can make a significant contribution to reducing it by changing their consumption behaviour^{10,11,12}. According to the Food Waste Index (FWI) developed by UNEP, in 2019, households were responsible for 61% of the 931 million tonnes of food wasted globally⁴. However, people themselves do not think that they produce large amounts of food waste¹³.

To address food waste, it is essential to have accurate data on how much is wasted in households, which is problematic as many measurement methods yield different results^{4,14,15,16,17} (Table 1). Each method has strengths and weaknesses, and it is advantageous to apply them in different situations and to achieve given research objectives^{15,16}. It is therefore not possible to clearly identify one method as the best¹⁸. In general, direct measurement methods, such as weighting, waste composition analysis, or diaries, are considered more accurate and reliable than self-reporting methods, such as

questionnaires^{14,15,16,19,20}. However, the application of direct methods is costly in terms of time, money, and logistics and is therefore not widely used¹⁷⁻²¹. The main disadvantage of the very commonly used self-reporting questionnaires is that people tend to underestimate the amount of food thrown away, but it also depends very much on the wording of the question^{20,22}. In recent years, researchers have been replacing the use of a single open-ended question in the questionnaire with more sophisticated measurement tools that would provide more accurate estimates^{22,23,24,25}.

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 **		Coefficients and production statistics **	
Processing and manufacturing					Waste composition analysis ***	Counting/scanning **
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.

Source: Nováková et al.²⁸, p. 5

In the Czech Republic, results on the amount of food waste produced by households vary widely. According to the latest figures for the European Commission, 73% of food waste is generated in households, or 69 kg per capita per year²⁶. This is almost identical to the result according to the Food Waste Index (FWI), which is 70 kg per capita per year⁴. However, both figures are only estimates calculated by extrapolation, and their accuracy is questionable. Much more reliable and accurate is the figure of 37.4 kg per capita per year, which is the result of the study using a direct method of municipal waste analysis of 900 Czech households; however, their subjective estimate was only 12.3 kg²⁷. A quite similar result was reported by Nováková et al.²⁸, who used the food diary method with a sample of 400 Czech households and arrived at a figure of 57.1 kg of food waste per capita per year.

This study aimed to quantify the amount of food waste produced by consumers in households through a more detailed and sophisticated questionnaire inspired by previous studies, to identify the most frequently wasted food by Czech households and to explore the reasons why people throw food away. The results of the study can contribute to the scientific debate on the (in)appropriateness of this self-reporting method for quantifying household food waste but also to use the questionnaire as a useful source of information to investigate people's attitudes and behaviour towards food waste in general. Moreover, the topic of food waste, despite its importance, is not adequately addressed in the Czech Republic.

Materials and methods

This study on food waste among consumers in the Czech Republic was conducted from mid-July to the beginning of September 2022 as part of the Czech Academy of Sciences' Strategy AV21 research project 'Foods for the Future'¹. The data were collected through personal interviews (CAPI method) by the Public Opinion Research Centre. The data were from a representative sample of the Czech population over the age of 15 years, selected by the quota method according to gender, age, education, region, and size of the place of residence. Respondents with missing values on food waste measures were excluded from the analysis (a total of six respondents). The final research sample comprised 815 respondents. The demographic characteristics of the research sample are shown in Table 2; 54.8% of the respondents were female, the average age was 47.4 years, and almost three-fifths of the respondents had secondary education with GCSE or higher.

¹ <https://strategie.avcr.cz/en/programy/potravinny>

Table 2: Demographic characteristics of the respondents (N = 815)

	N	%
Gender		
Male	368	45.2
Female	447	54.8
Age groups		
15–19	39	4.8
20–29	94	11.6
30–39	156	19.1
40–54	235	28.8
55–64	124	15.2
65+	167	20.5
Educational level		
Primary education	83	10.2
Secondary education without GCSE	248	30.4
Secondary education with GCSE	296	36.3
University/Higher education	188	23.1

The survey questionnaire used in this study is a partial replication of previously validated questionnaires from studies conducted in other countries (e.g., Serbia, Ireland, and Germany). Since this was a large survey focusing on other topics such as data labelling, diet regime, and food banks, only relevant questions for the objectives of this study were analysed. The questionnaire was divided into several parts. In the first part, respondents were asked about basic socio-demographic or quota characteristics (Table 2). The second part focused on the quantification of the amount of food waste produced by respondents. For the 14 different types of food presented, respondents were asked to first indicate the frequency and then the quantity of food thrown away in the last seven days. The types of food, which were inspired by Djekic et al.²³ and Richter²⁹, were fresh vegetables, fresh fruit, bread and bakery products, potatoes, rice, legumes, milk, yoghurt, cheese, meat, fish, sweet products, oils and fats and ready to eat meals. The frequency scale had seven options: every day, six times per week, five times per week, four times per week, three times per week, two times per week, once per week, and an alternative option that the respondent did not consume or waste a particular food item in the last week and also option 'don't know'. The quantity of food wasted was reported by respondents in grams (g) or millilitres (mL). For a more accurate estimate, following the findings of Djekic et al.²³, the respondents were informed that one handful is equivalent to approximately 20 g or 20 mL of food waste. The quantities of food waste in the survey data were calculated according to the following formula:

$$QFW = \sum_{j=1}^n F_j * Q_j$$

where F_j indicates the frequency and Q_j the quantity of a specific type of food (j) wasted in the last seven days reported by each respondent (j).

The last part explored both the causes of food wastage and not wastage. In terms of food waste, respondents were presented with 12 reasons for wasting food, which they were asked to rate on a five-point scale: 1 'never', 2 'rarely', 3 'sometimes', 4 'often' and 5 'always'. From the opposite perspective of not wasting food, respondents were asked to rate the importance of the eight reasons given on a 4-point scale (1 'very important', 2 'important', 3 'somewhat important' and 4 'not at all important').

The data received from the questionnaire were evaluated using different methods. As for the quantities of food waste, the amount of each food category discarded per week was calculated by multiplying the recorded weekly frequency of disposal and the estimated quantities. For the analysis, the response scale for frequency was reversed so that a higher number on the scale indicated a higher frequency of discard. The calculated weekly quantity of food waste was then converted to the total quantity in kilograms per person per year (the weekly amount was multiplied by the number of weeks in

a year, i.e., 52). Respondents who indicated that they 'don't know' whether they threw away a given food category were excluded from this analysis. The reasons for throwing and not throwing food away were ranked by frequency of response on a 5-point scale, respectively 4-point scale, and by means. Furthermore, exploratory factor analysis with the principal axis factoring method and varimax rotation was conducted in SPSS to identify whether the reasons for wasting food could be meaningfully grouped into fewer groups. The reasons for not wasting were explored in more detail by food wasters and zero wasters (Table 5).

Results

Quantities of food waste

The results showed (Table 3) that Czech consumer over the age of 15 discard on average 0.566 kg of food waste per week, or 29.4 kg per year. These estimates are very similar to studies in other countries that used the same methodology for estimating food waste quantities produced by consumers in households. For example, on average, 0.6 kg per person per week was found in Ireland²⁵, 0.5 kg in Serbia²³, or 0.9 kg in Bosnia and Herzegovina²⁴. Moreover, this result is much more similar to the result of the study conducted by Kubíčková et al.²⁷, in which was used the measurement method of waste composition analysis. According to their findings, the average inhabitant of the second largest Czech city (Brno) throws away 37.4 kg of food waste per year, but their subjective estimate was only 12.3 kg per person per year. However, the subjective estimate was measured using a simple question and clearly confirmed the results of other studies that applied a single question in a questionnaire to measure food waste, i.e., that this method gave significantly lower figures than the real amount of wasted food based on direct measurement through waste composition analysis^{27,30,31}.

Table 3: Calculated food waste quantities per food category and in total per person (N = 815) – means

Food category	Quantity per person (g)/(mL) per week	Quantity per person (kg) per year	Zero wasters ^a (%)	Don't know ^b (%)
Bread and bakery products (N = 593)	156.2	8.1	27.7	27.2
Ready to eat meals (N = 521)	127.9	6.7	36.7	36.1
Fresh fruit (N = 513)	97.5	5.1	39.5	37.1
Fresh vegetables (N = 527)	66.5	3.5	39.6	35.3
Milk (N = 461)	52.4	2.7	44.2	43.4
Sweet products (N = 452)	50.6	2.6	40.5	44.5
Yoghurt (N = 455)	47.9	2.5	41.2	44.2
Potatoes (N = 471)	44.5	2.3	43.3	42.2
Meat (N = 432)	23.4	1.2	43.8	47.0
Rice (N = 435)	16.8	0.9	46.1	46.6
Oils and fats (N = 441)	15.2	0.8	46.1	45.9
Cheese (N = 439)	13.5	0.7	45.3	46.1
Fish (N = 412)	7.7	0.4	47.0	49.4
Legumes (N = 418)	7.1	0.4	47.5	48.7
Total amount of food waste per person^c (N = 564)	566.2	29.4		

^a Percentage of zero wasters (i.e. people who never thrown away a given food category) in the sample

^b Percentage of people who 'don't know' whether they threw away a given food category and were therefore excluded from the analysis

^c Does not equal the sum of the food categories due to the different number of respondents (N) for each food category

In terms of quantity, people mostly throw away bread and bakery products, followed by ready to eat meals and fresh fruit. These results concur with studies conducted in other countries, such as Serbia²³ and Hungary^{32,33}. The results can also be looked at in terms of frequency of disposal and the opposite perspective, i.e., what type of food Czechs throw away least often (see column Zero wasters in Table 3).

Almost half of the Czech consumers never throw away fish, rice, oils and fats, and legumes. In contrast, most frequently discarded are bread and bakery products (27.7% of zero wasters), which corresponds to the surveys from Bosnia and Herzegovina²⁴, Serbia²³, and Switzerland³⁴. In the total sample, 14.1% (N = 115) are “zero wasters”, i.e. people who never throw away any food.

Further analysis showed that the female respondents reported significantly lower quantities of food waste in comparison with the male respondents (0.517 kg compared to 0.627 kg per person per week), which corresponds with the results of a study in Serbia²³. Regarding age and education, no statistically significant differences were found.

Reasons for wasted and not wasted food

People waste food for many reasons, with many studies confirming that the most common reasons are poor food management (spoilage), excessive quantities (cooked or bought too much), lack of food storage knowledge, and incorrect use of shelf-life information^{1,13,35}. This study examined 12 specific reasons for those respondents who throw away any food (N = 700). The results are shown in Figure 1. For Czech consumers, the main reason for disposing of food is unconsumable leftovers, e.g., scraps (53% at least ‘sometimes’), followed by rotten food (45%), forgetting about the food, cooking too much and expired dates of food (all 39%), which is in line with the previously mentioned studies.

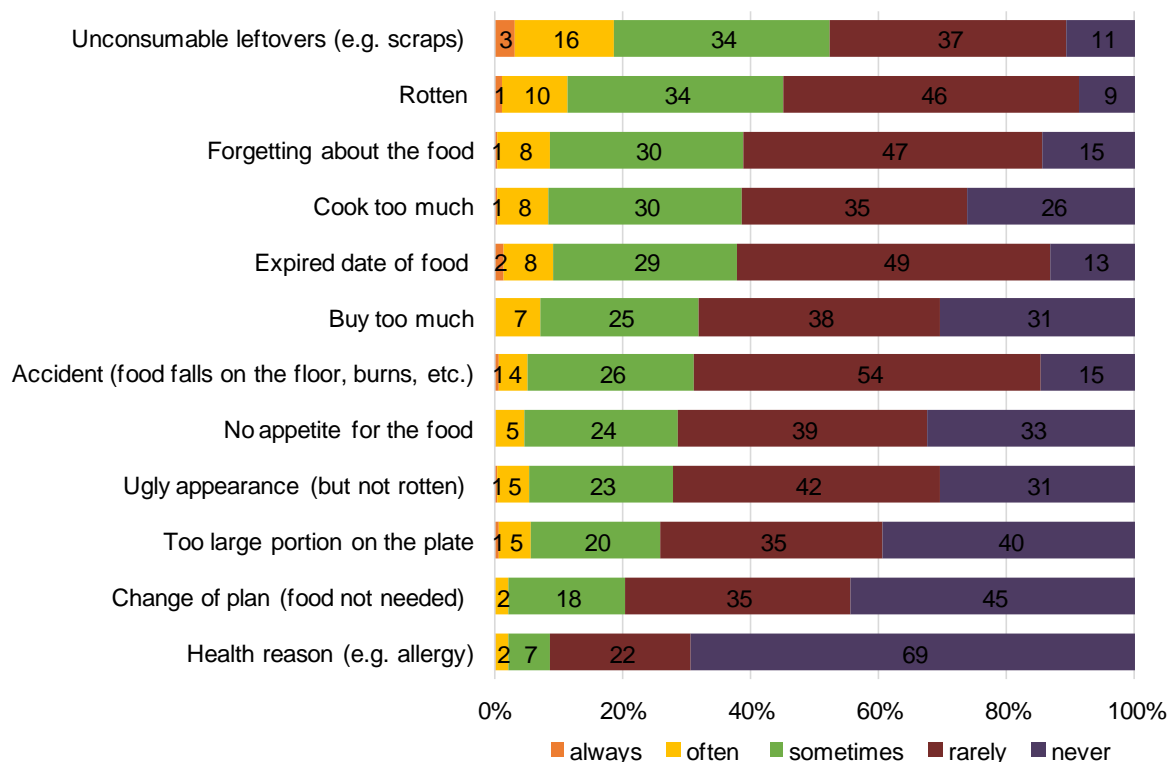


Figure 1: Reasons for throwing food away

Note: The reasons are ranked in descending order of the sum of the ‘always’, ‘often’ and ‘sometimes’ responses.

According to Parfitt et al.⁶, the reasons why people waste food can be divided into two broad categories: (1) cooked, prepared, or served too much, and (2) not used in time. This categorization was relatively confirmed in this study. The factor analysis with the principal axis factoring method explaining 35% of the total variance in the rotated solution clearly extracted two factors (see Table 4), with the first factor mainly comprising items related to the excessive quantity and the second factor related to not consuming food on time.

Table 4: Categorisation of reasons for throwing food away (N = 700)

Reason	Factor 1	Factor 2
No appetite for the food	0.66	
Change of plan (food not needed)	0.64	
Too large portion on the plate	0.61	
Cook too much	0.57	
Buy too much	0.56	
Ugly appearance (but not rotten)	0.45	
Health reason (e.g., allergy)	0.42	
Rotten		0.69
Expired date of food		0.65
Forget about the food		0.48
Unconsumable leftovers (e.g., scraps)		0.41
Accident (food falls on the floor, burns, etc.)		0.32

Note: Extraction method: Principal axis factoring, Rotation: Varimax.

Interesting findings came from the opposite perspective of why not to waste food (see Table 5). These questions were asked to all respondents, but the analysis was also conducted separately for wasters and zero wasters. The most important reason for not throwing food away is to save money, followed by environmental reasons and saving time spent buying and preparing food. On the other hand, the least important reasons for reducing food waste include the personal experience of not having enough food and the feeling that people can change society through their behaviour.

Significant differences were found between people who waste and those who do not. For zero wasters, i.e., those who declared they never throw away any food, all reasons were more important, with the highest being for the environmental aspect and the lowest for saving money. It can be concluded that zero wasters are aware of all the negative aspects of food wastage, i.e., social, environmental, economic, and ethical.

Table 5: Reasons for not throwing food away

	Whole sample (N = 815)	Wasters (N = 700)	Zero wasters (N = 115)
Reason	M (SD)	M (SD)	M (SD)
<i>Saving money</i> : it's possible to save money	1.85 (0.82)	1.86 (0.80)	1.73 (0.91)
<i>Environmental reasons</i> : food waste is bad for the environment	2.32 (1.01)	2.38 (0.99)	1.96 (1.06)
<i>Saving time</i> : not spending time preparing wasted food	2.33 (1.04)	2.36 (1.02)	2.12 (1.09)
<i>Social reasons</i> : there are people who have nothing to eat	2.48 (1.01)	2.52 (0.98)	2.27 (1.16)
<i>Everyday social responsibility</i> : set an example for others	2.50 (1.04)	2.54 (1.03)	2.26 (1.13)
<i>Global social responsibility</i> : our role in producing waste	2.70 (1.01)	2.73 (0.98)	2.49 (1.16)
<i>Personal experience</i> : have personally experienced having not enough food	2.81 (1.11)	2.86 (1.08)	2.51 (1.24)
<i>Social responsibility</i> : a chance to influence society	2.90 (1.01)	2.94 (0.97)	2.65 (1.22)

Note: A lower mean indicates higher importance. Items are ranked according to the results of the whole sample. M = Mean, SD = Standard Deviation

Discussion

This study aimed to contribute to the discussion regarding the measurement of food waste produced by consumers. Although the number of studies has been increasing in recent years, there is still a lack of studies^{14,17,18}. At the same time, it is worth emphasizing that food waste is a complex problem, and throwing away food at the last stage – at the consumer level – is just the tip of the iceberg¹². To address this problem, it is first necessary to define exactly what is meant by food waste or food loss and then involve actors from different spheres (government, public, private, and NGOs) in the subsequent solution, focusing on the entire food supply chain^{1,6}.

The most accurate method of measuring food waste in households is the direct measurement method through waste composition analysis. However, logistically this is time-consuming and costly. Thus, for mandatory measurement and reporting, estimates based on public statistical indicators or subjective estimation by the respondents themselves are frequently used, which in terms of feasibility, are simple but imprecise^{14,17,27,30}. Several studies have been conducted that applied different methods to measure food waste in households and compared their results, such as waste analysis and diaries³⁶, waste analysis and questionnaires^{27,31}, waste analysis, diaries and questionnaires³⁰, and diaries and questionnaires³⁷. These studies clearly showed that the calculated estimates of the amount of food wasted in households based on questionnaires are significantly lower than the real amount of food wasted, with an estimate of about a one-third difference. At the same time, most of these studies were not carried out on a representative sample and, for the subjective estimate, used one open-ended question, which greatly affected the results. Van Herpen et al.²² demonstrated that a more sophisticated questionnaire methodology yielded more accurate results.

This study, therefore, used a more complex questionnaire to estimate the amount of food thrown away by Czech consumers in a representative sample of the Czech population over 15 years of age. The results presented in this paper were consistent with similarly methodologically focused studies in other countries^{23,24,25} and showed that using a more sophisticated methodology in a questionnaire to subjectively estimate food waste provides significantly less biased results than using a simple question. At the same time, however, several specific problems with using questionnaires to quantify the amount of food waste produced by consumers can be defined. First, the respondents were unable to estimate the amount of food waste correctly and very often tended to answer 'don't know' (ranging from 27% to 49% for each item). Second, the measurement methodology applied in this study showed that in some cases, it was not certain whether the respondents reported the quantity thrown away for the whole week or one time only, which then affects the overall estimate. Related to this is the fact that the recalculation is based on the same amount for each discard. Third, people forget and sometimes do not remember whether or not they threw away a given food item in the last week. Fourth, the total amount of food waste is highly dependent on the items or food categories surveyed. When preparing the questionnaire, it is essential not to omit any food category. Fifth, a simple conversion to food waste per year may be biased by the time of data collection, as some studies have shown that the amount of food waste produced by consumers is influenced by the season^{27,38}. Last but not least, generally, people tend to underestimate the amount declared, which is undoubtedly related to the fact that people think they do not throw away large amounts of food, which has been confirmed by research³⁵. Possible explanations include social desirability or behavioural reactivity³⁶.

One primary solution to prevent household food waste is education and awareness to encourage people to change their consumption behaviour^{11,34,39}. Given that people waste food most often due to poor food management and generally excessive amounts, it is essential to educate them about planning their shopping⁹, proper food storage, adequate consumption, and, undoubtedly, a better understanding and use of date marking on food, i.e., 'use by' and 'best before' dates, which cause up to 10% of the total amount of food waste in the European Union⁴⁰. Financial losses are also a strong motive for reducing waste^{13,41}, which was also confirmed by this study. Other solutions include the use of smart technologies or appropriate packaging^{11,42}.

Conclusions

The present study provides much information on the topic of food waste in the Czech Republic. This study was designed to partially replicate previous similar studies on food waste in the European context in terms of exploring causes and quantities by using a more sophisticated questionnaire. According to the results, the average Czech over the age of 15 throws away 29.4 kg of food per year.

This study has shown that a more sophisticated and well-designed survey instrument compared to a simple question can provide significantly more realistic figures on the amount of food waste produced by consumers²⁷ and confirmed the results of Van Herpen et al.²². In addition; the questionnaires can provide a lot of additional information about the factors that influence people's attitudes and behaviour

towards food waste. Bread and bakery products, ready to eat meals and fresh fruit were the types of food most frequently discarded.

About the main reasons for food waste, the respondents most frequently cited non-consumable leftovers, food spoils, or that they forget about the food. Reasons related to excessive quantities (cook or buy too much or a large portion on the plate) were also very common. Saving money, on the other hand, comes out as the most important reason for not wasting. People who do not waste at all are significantly more aware of all the negative reasons associated with throwing away food compared to wasters.

Acknowledgement

This study was supported under the AV21 Strategy of the Academy of Sciences as part of the 'Food for the Future' research programme and with institutional support RVO: 68378025.

References

1. Aschemann-Witzel J., de Hooge I., Amani P., Bech-Larsen T., Oostindjer M.: Consumer-Related Food Waste: Causes and Potential for Action. *Sustainability* 7, 6457 (2015). doi: 10.3390/su7066457
2. FAO (2019): The State of Food and Agriculture 2019. Moving forward on food loss and waste reduction. Food Agriculture Organization of United Nations, Rome, Italy.
3. Philippidis G., Sartori M., Ferrari E., M'Barek R.: Waste not, want not: A bio-economic impact assessment of household food waste reductions in the EU. *Resour., Conserv. Recycl.* 146, 514 (2019). doi: 10.1016/j.resconrec.2019.04.016
4. UNEP (2021): Food Waste Index Report 2021. Nairobi. Available at: <https://www.unep.org/resources/report/unep-food-waste-index-report-2021>
5. Gustavsson J., Cederberg C., Sonesson U.: Global food losses and food waste: Extent, causes and prevention. FAO, Rome. 2011. Available at: <http://www.fao.org/3/ai2697e.pdf>
6. Parfitt J., Barthel M., Macnaughton S.: Food waste within food supply chains: Quantification and potential for change to 2050. *Philos. Trans. R. Soc., B* 365(1554), 3065 (2010). doi: 10.1098/rstb.2010.0126
7. Fami H. S., Aramyan L. H., Sijtsema S. J., Alambaigi A.: Determinants of household food waste behavior in Tehran city: A structural model. *Resour., Conserv. Recycl.* 143, 154 (2019). doi: 10.1016/j.resconrec.2018.12.033
8. Priefer C., Jörissen J., Bräutigam K.-R.: Food waste prevention in Europe – A cause-driven approach to identify the most relevant leverage points for action. *Resour., Conserv. Recycl.* 109, 155 (2016). doi: 10.1016/j.resconrec.2016.03.004
9. Stefan V., van Herpen E., Tudoran A. A., Lähteenmäki L.: Avoiding food waste by Romanian consumers: The importance of planning and shopping routines. *Food Quality and Preference* 28(1), 375 (2013). doi: 10.1016/j.foodqual.2012.11.001
10. Stenmarck Å., Jensen C., Quested T., Moates G.: Estimates of European food waste levels. Research report FUSIONS. IVL Swedish Environmental Research Institute, Stockholm. 2016. doi: 10.13140/RG.2.1.4658.4721
11. Schanes K., Dobernic K., Gözet B.: Food waste matters – A systematic review of household food waste practices and their policy implications. *J. Cleaner Prod.* 182, 978 (2018). doi: 10.1016/j.jclepro.2018.02.030
12. Quested T. E., Marsh E., Stunell D., Parry A. D.: Spaghetti soup: The complex world of food waste behaviours. *Resour., Conserv. Recycl.* 79, 43 (2013). doi: 10.1016/j.resconrec.2013.04.011

13. Cox J., Downing P.: Food Behaviour Consumer Research: Quantitative phase. WRAP. Brook Lyndhurst. 2007. Available at: <https://wrap.org.uk/sites/default/files/2020-12/Food-behaviour-consumer-research-quantitative-phase.pdf>
14. Cicatiello C., Giordano C.: Measuring household food waste at national level: A systematic review on methods and results. *CABI Reviews*, 2018, 1. doi: 10.1079/PAVSNNR201813056
15. Møller H., Hanssen O. J., Gustavsson J., Östergren K., Stenmarck Å.: Report on review of (food) waste reporting methodology and practice. Report from FUSIONS. 2014. Available at: <http://www.eu-fusions.org/index.php/publications>
16. Møller H. and 15 coauthors: Standard approach on quantitative techniques to be used to estimate food waste levels. Report from FUSIONS. 2014. Available at: <http://www.eu-fusions.org/index.php/publications>
17. Xue L., Liu G., Parfitt J., Liu X., Van Herpen E., Stenmarck Å., O'Connor C., Östergren K., Cheng S.: Missing Food, Missing Data? A Critical Review of Global Food Losses and Food Waste Data. *Environ. Sci. Technol.* 51(12), 6618 (2017). doi: 10.1021/acs.est.7b00401
18. Withanage S. V., Dias G. M., Habib K.: Review of household food waste quantification methods: Focus on composition analysis. *J. Cleaner Prod.* 279, 123722 (2021). doi: 10.1016/j.jclepro.2020.123722
19. Teuber R., Jensen J.: Food losses and food waste: Extent, underlying drivers and impact assessment of prevention approaches. IFRO Report. Department of Food and Resource Economics, University of Copenhagen. 2016.
20. van Herpen E., van der Lans I. A., Holthuysen N., Nijenhuis-de Vries M., Quested T. E.: Comparing wasted apples and oranges: An assessment of methods to measure household food waste. *Waste Manage.* 88, 71 (2019). doi: 10.1016/j.wasman.2019.03.013
21. Parizeau K., von Massow M., Martin R.: Household-level dynamics of food waste production and related beliefs, attitudes, and behaviours in Guelph, Ontario. *Waste Manage.* 35, 207 (2015). doi: 10.1016/j.wasman.2014.09.019
22. van Herpen E., van Geffen L., Nijenhuis-de Vries M., Holthuysen N., van der Lans I., Quested T. E.: A validated survey to measure household food waste. *MethodsX* 6, 2767 (2019). doi: 10.1016/j.mex.2019.10.029
23. Djekic I., Miloradovic Z., Djekic S., Tomasevic I.: Household food waste in Serbia – Attitudes, quantities and global warming potential. *J. Cleaner Prod.* 229, 44 (2019). doi: 10.1016/j.jclepro.2019.04.400
24. Djekic I., Operta S., Djulancic N., Lorenzo J. M., Barba F. J., Djordjević V., Tomasevic I.: Quantities, environmental footprints and beliefs associated with household food waste in Bosnia and Herzegovina. *Waste Manage. Res.* 37(12), 1250 (2019). doi: 10.1177/0734242X19873709
25. Flanagan A., Priyadarshini A.: A study of consumer behaviour towards food-waste in Ireland: Attitudes, quantities and global warming potentials. *J. Environ. Manage.* 284, 112046 (2021). doi: 10.1016/j.jenvman.2021.112046
26. Eurostat (2023): Food waste and food waste prevention – estimates [online] [cit. 2023-04-23]. Available at: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Food_waste_and_food_waste_prevention_-_estimates#Amounts_of_food_waste_at_EU_level
27. Kubíčková L., Veselá L., Kormaňáková M.: Food Waste Behaviour at the Consumer Level: Pilot Study on Czech Private Households. *Sustainability* 13(20), 11311 (2021). doi: 10.3390/su132011311
28. Nováková P., Hák T., Janoušková S.: An Analysis of Food Waste in Czech Households – A Contribution to the International Reporting Effort. *Foods* 10(4), 875 (2021). doi: 10.3390/foods10040875
29. Richter B.: Knowledge and perception of food waste among German consumers. *J. Cleaner Prod.* 166, 641 (2017). doi: 10.1016/j.jclepro.2017.08.009

30. Giordano C., Piras S., Boschini M., Falasconi L.: Are questionnaires a reliable method to measure food waste? A pilot study on Italian households. *Br. Food J.* 120(12), 2885 (2018). doi: 10.1108/BFJ-02-2018-0081
31. Delley M., Brunner T. A.: Household food waste quantification: Comparison of two methods. *Br. Food J.* 120(7), 1504 (2018). doi: 10.1108/BFJ-09-2017-0486
32. Kasza G., Dorkó A., Kunszabó A., Szakos D.: Quantification of Household Food Waste in Hungary: A Replication Study Using the FUSIONS Methodology. *Sustainability* 12, 3069 (2020). doi: 10.3390/su12083069
33. Szabó-Bódi B., Kasza G., Szakos D.: Assessment of household food waste in Hungary. *Br. Food J.* 120(3), 625 (2018). doi: 10.1108/BFJ-04-2017-0255
34. Visschers V. H., Wickli N., Siegrist M.: Sorting out food waste behaviour: A survey on the motivators and barriers of self-reported amounts of food waste in households. *Journal of Environmental Psychology* 45, 66 (2016). doi: 10.1016/j.jenvp.2015.11.007
35. WRAP (2007): We Don't Waste Food! A Householder Survey. Final Report. Available at: <https://wrap.org.uk/sites/default/files/2020-12/We-dont-waste-food-A-household-survey-2006.pdf>
36. Quested T. E., Palmer G., Moreno L. C., McDermott C., Schumacher K.: Comparing diaries and waste compositional analysis for measuring food waste in the home. *J. Cleaner Prod.* 262, 121263 (2020). doi: 10.1016/j.jclepro.2020.121263
37. Koivupuro H.-K., Hartikainen H., Silvennoinen K., Katajajuuri J.-M., Heikintalo N., Reinikainen A., Jalkanen L.: Influence of socio-demographical, behavioural and attitudinal factors on the amount of avoidable food waste generated in Finnish households. *International Journal of Consumer Studies* 36(2), 183 (2012). doi: 10.1111/j.1470-6431.2011.01080.x
38. Adelodun B., Kim S. H., Choi K.-S.: Assessment of food waste generation and composition among Korean households using novel sampling and statistical approaches. *Waste Manage.* 122, 71 (2021). doi:10.1016/j.wasman.2021.01.003
39. Kim J., Rundle-Thiele S., Knox K., Burke K., Bogomolova S.: Consumer perspectives on household food waste reduction campaigns. *J. Cleaner Prod.* 243, 118608 (2020). doi: 10.1016/j.jclepro.2019.118608
40. European Commission (2018): Market study on date marking and other information provided on food labels and food waste prevention: final report. Publications Office. Available at: <https://data.europa.eu/doi/10.2875/808514>
41. Hanzlová R.: Food Waste and the Shopping and Consumer Behaviour of Czech Households – Food 2021. Press Release [online]. Public Opinion Research Centre, 2021 [cit. 2023-04-23]. Available at: https://cvvm.soc.cas.cz/media/com_form2content/documents/c6/a5469/f77/OR211119_ENG.pdf
42. Hebrok M., Boks C.: Household food waste: Drivers and potential intervention points for design – An extensive review. *J. Cleaner Prod.* 151, 380 (2017). doi: 10.1016/j.jclepro.2017.03.069

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

Souhrn

K plýtvání potravinami dochází v průběhu celého distribučního řetězce potravin, přičemž největší podíl z celkového potravinového odpadu mají na svědomí lidé v domácnostech, tedy spotřebitelé. Pro zjištění, jaké množství potravin lidé v domácnostech vyhodí lze využít různých metod, přičemž jejich výsledky se velmi liší. Za nejvíce přesné jsou považovány metody přímého měření, nicméně jejich využití vzhledem k finanční, logistické i časové náročnosti není příliš časté, a proto se velmi často využívají dotazníky založené na subjektivním odhadu respondentů.

Tento článek představuje výsledky studie, jejímž cílem bylo prostřednictvím více propracovaného dotazníku kvantifikovat množství vyplývaných potravin českými spotřebiteli, identifikovat nejčastěji vyhazované typy potravin a také prozkoumat, proč lidé potravinami plýtvají a i naopak, co je motivuje, aby plýtvání potravinami předcházeli. Analýza je založena na reprezentativním vzorku české populace starší 15 let (N = 815).

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.

Klíčová slova: plýtvání potravinami, potravinový odpad, množství potravinového odpadu, příčiny, dotazníkové šetření, spotřebitelé, Česká republika