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THE ATTITUDE OF GREEKS TOWARDS FOOD WASTE

Abstract

The subject of the present paper is an empirical study of the attitude and behaviour of Greek consumers on the issue of food waste. In March 2022 an empirical investigation was organized as a continuation of previous research on this issue. In order to conduct the research in a short time, the convenience research method was chosen. A structured questionnaire with cross-references from previous research (Pitoska & Grana 2021) was used to collect data. Finally, it seems that the issue of food waste is known in Greece but there are big limitations for informing consumers so the country will approach the European goals for reducing food waste.

Keywords: food waste, recycling, consumer, households

JEL classification: D1, D12

ОДНОС ГРКА ПРЕМА ОТПАДУ ОД ХРАНЕ

Апстракт

Предмет овог рада је емпиријско истраживање о ставовима и понашању грчких потрошача по питању отпада од хране. У марту 2022. године организовано је емпиријско истраживање као наставак претходног истраживања о овом питању. Да би се истраживање спровело за што краће време, изабран је метод истраживања погодности. За прикупљање података коришћен је структурирани упитник са унакрсним референцама из претходног истраживања (Pitoska & Grana 2021). Прикупљено је укупно 450 упитника са одговорима. Чини се да је проблем расипања хране познат у Грчкој, али постоје велика ограничења за информисање потрошача, па ће се земља приближити европским циљевима смањења бацања хране.

Кључне речи: отпад хране, рециклажа, потрошач, домаћинства

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Introduction

Food waste has a direct impact on the environment (e.g., energy, climate change, resource availability), the economy (e.g., resource efficiency, price volatility, rising costs, consumption, waste management, commodity markets), and society (e.g., health, equality). It is a problem that affects both global food security and good environmental governance. According to various studies, between 1/3 and 1/2 of the food produced worldwide is not eaten (Gustavsson et al., 2011; Bio Intelligence Service, 2010), which has an adverse effect on homes as well as the rest of the food supply chain. The transition to a resource-efficient Europe is vital to prevent and reduce food waste.

For this important issue, the European Commission funded the project FUSIONS (Food Use for Social Innovation by Optimizing Waste Prevention Strategies), which was aimed to estimate food waste generation in the EU (<https://www.eu-fusions.org/>) and implemented in 2007-2012 with financial support from the EU's Research and Innovation 7th Framework.

As part of the program, a paper was prepared in Stockholm on 31 March 2016 and entitled "Estimates of European food waste levels". The authors of the paper were: Åsa Stenmarck (IVL), Carl Jensen (IVL), Tom Quested (WRAP), Graham Moates (IFR) and contributing partners: Michael Buksti (Communique), Balázs Cseh (HFA), Selina Juul (SWF), Andrew Parry (WRAP), Alessandro Politano (UniBo), Barbara Redlingshofer (INRA), Silvia Scherhauser (BOKU), Kirsi Silvennoinen (LUKE), Han Soethoudt (Wageningen UR), Christine Zübert (UHOH), Karin Östergren (SP).

The task described in this report was to obtain an EU-28 estimate for food waste. In this report information from Greece is not enough and especially information about food waste by households (e.g., Table 14. Summarizing evaluation of data provided by member states page 63). This was the occasion to start an empirical investigation which is ongoing and of which this paper forms a part.

1. Food waste and the food waste policy in the EU

There is a distinct difference between food loss and food waste, according to the Federation of Polish Food Banks' Working Group of Rational Use of Food. Food waste refers to the irrational financial management of food in the hospitality industry and consumer households. Food loss is the measurement of the reduction in the edible mass of food caused by improper management, mistakes, and irregularities during production, distribution, and trade (Wrzosek, Kooyon-Krajewska, & Krajewski, 2012).

The reasons driving consumers to waste food are varied and are largely contingent upon the country- and area-specific circumstances. Consumer habits are shaped by social factors, specific consumer attitudes and views about food, and, finally, by consumers' poor information, knowledge, and skills. Remarkably, the psychographic profile of consumers has received increasing attention in the relevant literature about waste issues (Russell, Young, Hardin, & Robinson, 2017).

According to a Mass Flow Analysis by Caldeira et al. (2019a), around 638 Mt of food commodities were available for human consumption in the EU7 in 2011 (Kemna et al., 2017), generating approximately 129 Mt (fresh weight) of food waste along the whole food supply chain.

Table 1: Food waste generated in the EU-28 by food group (2011 data)

Food waste generated in the EU-28 by food group (2011 data)					
Plant-based				Animal-based	
Vegetables 24%	Fruit 22%		Cereals 12%		Meet 11%
	Oil Crops 10%	Potatoes 7%	Sugarbeet 4%	Dairy 5%	
				Fish 3%	Eggs 2%

Source: Caldeira et al. (2019a)

Hence, food waste accounts for 20% of the food produced. This estimate is significantly higher than that of the FUSIONS project (88 Mt), which was used as a reference for policymaking (e.g., in the Farm to Fork Strategy (EC, 2020)). Vegetables (24%) and fruit (22%) are the food groups that produce the largest amounts of food waste, followed by cereals (12%), meat (11%), and oil crops (10%). The fish and eggs food groups, which make up the smallest parts of the food supply chain, also generate the lowest quantities of food waste in absolute terms, despite the fact that much of these food groups (50% and 31% respectively) go to waste.

The EU has been working to expand and improve the measurement of food waste levels in order to guarantee that national initiatives to reduce food waste are supported by a strong evidence base and encourage the sharing of innovation and best practices. The updated Waste Framework Directive, which took effect on May 30, 2018, mandates that Member States monitor food waste levels, reduce food waste at every stage of the food supply chain, and report on their progress. Additionally, it establishes requirements for Member States to:

- create programs to prevent food waste (specific or as a component of general waste prevention programs);
- promote food donation and other redistribution for human consumption, giving human use priority over animal feed and reprocessing into non-food products;
- offer incentives for the use of the waste hierarchy, such as facilitating food donation (articles 4 and 9 of the revised Waste Framework Directive).

2. Food waste and consumer behaviour

The increasing number of food markets has been accompanied by the evolutionary effect of food waste and loss and is associated with irrational food management. The problem of food waste has taken on environmental and economic dimensions and has been closely related to the social and moral conditions affecting consumers.

For the last few decades, food waste has reached alarming proportions with economic, social, and environmental implications. Regarding the impact of food waste on the environment, it is estimated that 8% of greenhouse gas emissions from human activities are produced by food waste. Wasted food in landfills releases methane, which is 25 times as harmful as CO₂ (Garnett, 2008; Hall et al., 2009). The problem of food waste is mainly caused by consumers whose tendency to buy food in larger quantities than necessary has now been a regular habit. Remarkably, 53% of all food waste is household waste, that is, it is produced during consumption (Gustavsson, Cederberg, Sonesson, van Otterdijk, & Meybeck,

2011). Vast amounts of food waste are observed in middle- and high-income countries, which implies that food is thrown away despite being still safe for consumption.

As regards food waste in Greece, ranked third among the worst European Union countries in terms of understanding the “best before” label, the extant research has demonstrated that only 22% of the Greek citizens fully understand the specific warning about food (WWF, 2020).

In addition, the number of Greek consumers who would throw away food after the “best before” date, irrespective of whether it is safe to consume, is twice the average in the European Union (WWF, 2020). Greece is fourth among the worst EU countries in terms of food waste, which accounts for 196 kg for each Greek citizen compared to 173 kg of annual food waste for each European (WWF, 2020). In addition, Greek households waste 98.9 kg of food surplus annually, and about 1.4 million people, namely, 12.9% of the population, were food insecure in 2015, whereas 5.1% of food production for human consumption is wasted per year, more than double the European average (WWF, 2020).

3. Factors - reducing food waste and consumer attitudes

Food waste and loss occur during all stages of the food supply chain, from food storage, transport, and processing to food shops and restaurant kitchens, hotels, and households (Lundqvist, de Fraiture, & Molden, 2008). It is a global phenomenon observed at various stages of the food supply chain. With a view to achieving more efficient food management, the European Union drafted a report in 2016, “Estimates of European food waste levels”, in the EU-28. Data collection and analysis from all 28 EU members demonstrated that food waste accounts for 88 million tonnes (Stenmarck et al., 2016).

In recent years, the international literature has focused on food waste, particularly in households. It has also explored the drivers for consumer attitudes toward food waste and emphasized the social, environmental, and psychological factors underlying individuals’ behavior toward food waste (Russell et al., 2017). Due to the complex attitudes affecting the amount and occurrence of household food waste, it is rather hard to make any relevant predictions (Quested, Marsh, Stunell, & Parry, 2013). In addition, actions aimed at reducing household food waste are characterized as rather poor and inefficient. Despite the fact that the psychological underlying mechanisms are not primarily explored, there is a significant focus on the methods to identify motivation and/or barriers to prevent household food waste reduction (Graham-Rowe, Jessop, & Sparks, 2015). Consumers who positively evaluate the effectiveness of waste management activities are in favor of sustainability-related behaviors (Swami, Chamorro-Premuzic, Snelgar, & Furnham, 2011), mainly adopted by people who are convinced that their welfare is threatened. Subjective-personal rules have also been found to play a significant role in shaping waste management attitudes (Barr, 2007).

Research in the environmental factors involved in food waste (Dunlap, Van Liere, Mertig, & Jones, 2000) has shown that people who are more concerned about their bodies than the environment display a less environmentally friendly attitude (Schultz & Zelezny, 1999). On the other hand, other studies highlight that there is a rather weak or moderate correlation between environmental concern and environmentally friendly attitudes (Bamberg, 2003).

In the framework of the European project “Fusions Drivers”(Canali et al., 2014), the results revealed the following groups of factors typically affecting consumer behaviour towards food waste:

- social factors, such as household type, stage of family life, and relevant lifestyle,
- consumers’ attitudes and views about food,
- consumers’ poor information, knowledge, and skills.

The European Parliament report “Tackling food waste: The EU’s contribution to a global issue” underlines that social urbanisation trends and changes in diet, as well as consumers’ overall culture, are key determinants of consumer behaviour (EPRS, 2016).

An interesting model of the factors affecting consumer behaviour towards food waste has been proposed by Aschemann-Witzel, de Hooge, Amani, Bech-Larsen, & Oostindjer (2015). The model includes two groups of factors, socio-demographic and psychological, which are fundamental for explaining consumers’ attitudes toward food waste.

Activities aimed at reducing food waste can be also affected by financial factors. The financial crisis may trigger some alternative or new patterns of behaviour called “freeganism” or “dumpster diving”. In addition, the tendency to avoid wasting food can be part of a lifestyle and a consumer’s identity (Aschemann-Witzel et al., 2015).

It has also been demonstrated that attitudes towards food waste depend on consumers’ understanding of the information on product packaging, in particular, information about the date of minimum durability and expiry date (Newsome et al., 2014). However, the correct use of the terms “expiry date/use by” and “best before” is not sufficiently understood by consumers, who interpret them differently depending on food type (Van Boxtael, Devlieghere, Berkvens, Vermeulen, & Uyttendaele, 2014).

Consumers are aware of the principles of rational household food management. Rational storage management in warehouses and markets usually requires a schedule compliant with reducing food waste methods. Educational activities focused on waste-minimising behaviours, which should be carried out at an early age, play a significant role in reducing food waste (Radzyminska, Jakubowska, & Staniewska, 2016).

In the extant literature, consumers’ attitudes and behaviours toward food waste are affected by various factors. Consumer knowledge and awareness do not fully reflect the activities of anti-food waste supporters (Radzyminska et al., 2016).

Food waste typically occurs during consumption. Households produce the greatest amount of wasted food; thus, food waste is mainly consumer-related. The major concern of all those involved in food waste is, first, to inform consumers about the significance of the specific problem and then provide valuable information on more efficient food management. In addition to consumers’ benefits, social and economic advantages are also perceived among the major goals of actions aimed at raising awareness of food waste. Various methods to reduce food waste have been suggested: shopping lists, checking expiry dates, budget control, refrigerator maintenance, cooking meals with leftovers, freezing food and composting.

4. Empirical study

This research is organized as a continuation of previous research on food waste in Greece and the attitude of Greek consumers on this issue.

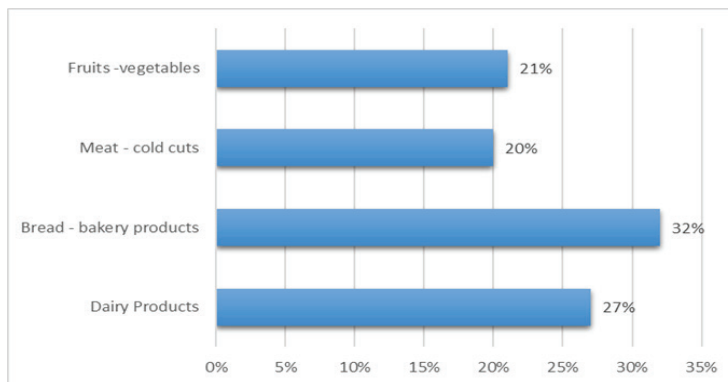
The research was carried out to investigate food waste and, more specifically, the amount of food waste in Greece, as well as consumer attitudes and behaviour. In order to conduct the research in a short time, the convenience research method was chosen. For data collection, a cross-referenced structured questionnaire from previous research (Pitoska & Grana 2021) was used. The questionnaire with 15 questions was administered via Google Forms from 01/03/2022 to 31/03/2022. A total of 450 answered questionnaires were collected.

Data analysis demonstrated that 41% of the survey participants are aware of the problem of “Food Waste”. It appears that only 8% of the respondents are totally ignorant and a smaller number (17.3%) have only got a vague and rather general idea.

The main source of information is the Internet (48.7%), the media (16.0%) as well as social institutions (16.7%), whereas it was also stated the relevant information is based on other sources 18.7%. Only half of the survey participants (52.7%) estimate that food waste has got a direct impact on their income, and 30% of them do not have an opinion on this question. 30.7% and 25.30% of all survey participants “often” and “always” check expiry dates, respectively. Finally, the subjects stated that they “sometimes” (25.3%) or “rarely” (12.7 %) check expiry dates and only 6 % never check dates.

In addition, 52.0% of the respondents answered that they had knowingly and intentionally consumed food after the expiry date, whereas 56.6% has purchased food in damaged packaging provided that the content has not been visibly affected. The subjects appear to distinguish between “expiry date/use by” and “best before” on food products (65.3%). Survey participants stated that they throw away the following food categories (Graph 1).

Graph 1. The most frequently wasted type of food



The participants who plan their meals for the next 3-4 days are 25.3%. It seems that most people neglect or do not care to plan meals and the necessary food purchases.

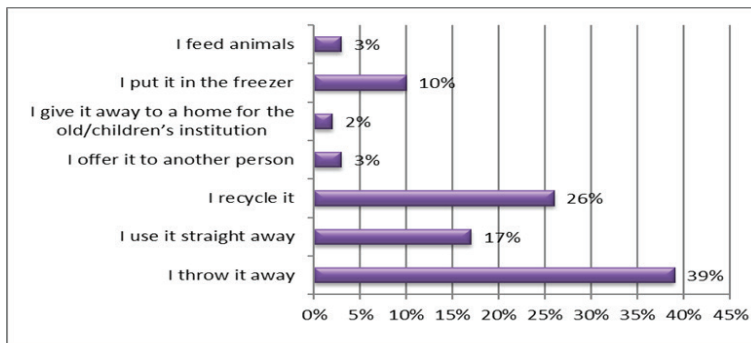
The participants appear to make efforts to adopt management practices for efficient purchase planning and organisation, as the majority use a shopping list, and try to buy only food list items.

Table 2 Management practices for efficient purchase

	Use a shopping list	Buy only food list items
Never	7.3%	8.0%
Rarely	20.0%	22.0%
Sometimes	34.7%	37.3%
Often	19.3%	26.7%
Always	18.7%	6.0%

Food management practices for “use-by” food demonstrate that the subjects do not adopt sustainability-related attitudes, as the number of answers to questions about whether they are willing to offer food either to another person or vulnerable groups (i.e., a home for the old) is too low, whereas 10% of the respondents answered that they store food in a freezer and 17% consume food straight away. Only 26% of them use recycling methods and 39% tend to throw away food close to its expiry date. To this question, a matching of the answers with the previous survey of 2021 of Pitoska & Grana is recorded.

Graph 2. Management practices for “use-by” food



The reasons for “throwing away” food are shown in Table 3.

Table 3. Reasons for throwing away food

Reasons for throwing away food	Percentage %
It has expired	78.7
Food I really do not need	31.3
Nasty appearance/condition	46.7
We have not finally eaten leftovers	59.3
We forgot the food was in or out of the fridge	63.9
It did not taste good (but not rotten)	60
Rotten food	77.3
Ruined cooked food (burnt, overcooked, too salty, etc.)	65.3

The analysis demonstrated that consumers who answered, “I feel sorry when I throw away food”, represent 61.3%. However, 19.3% are not bothered at all when throwing food.

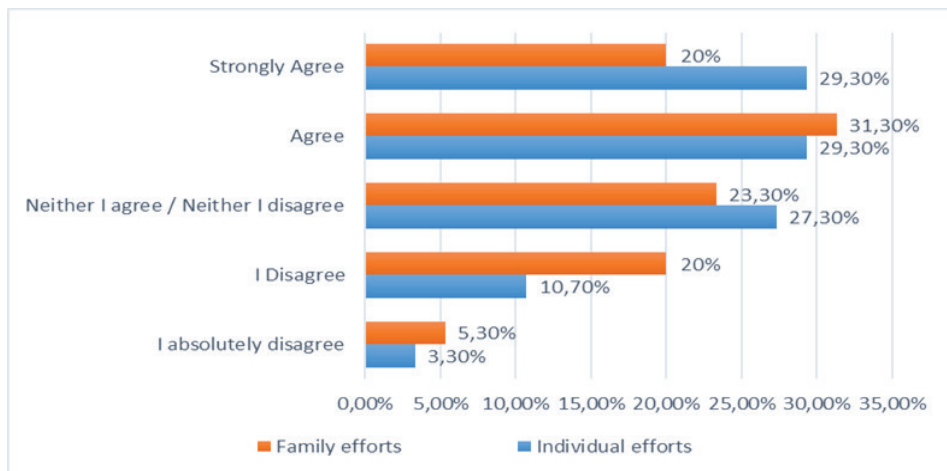
The extent to which consumers are also concerned about the amount and cost of the food they throw away is reflected in the table below.

Table 4. Degree of interest for the amount and cost

	I do not care about the amount of food I throw away	I am not concerned about the cost of the food that I will throw away
I absolutely disagree	30.0%	39.3%
I disagree	38.7%	27.3%
Neither do I agree / Neither do I disagree	16.0%	14.7%
Agree	11.3%	11.3%
Strongly Agree	4.0%	7.3%

It seems that individual/personal efforts (58.60%) to reduce household food waste are slightly stronger than the overall family effort (51.30%).

Graph 3. Individual & family efforts to reduce the amount of food thrown away



According to the responses of the participants, they would reduce the food they throw/waste if they had better information. The information that, according to what was stated, would lead them to reduce the food waste, is recorded with the corresponding percentages in table 5.

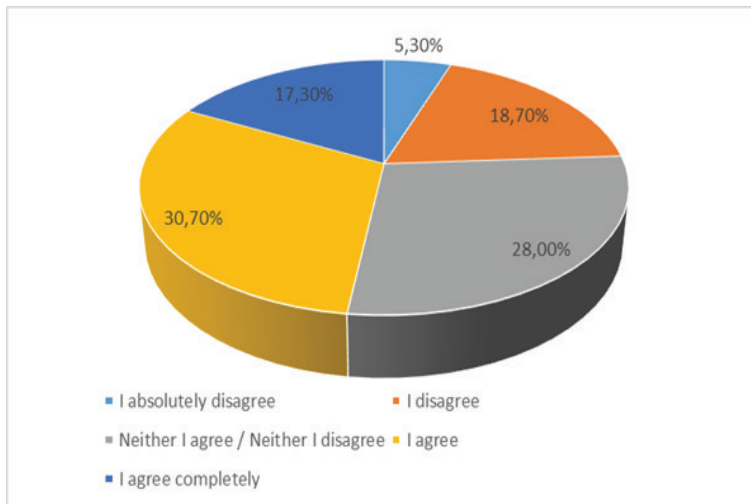
It seems that the information that consumers have on the issue of food waste is insufficient. Despite the fact that the country's economy has gone through a ten-year economic recession, consumers do not seem to have corresponding information about food waste that also affects their disposable income.

Table 5. Estimates for effective information

	For more efficient / better food storage	For a more efficient way of shopping for food	On the environmental impact of food waste	For the cost of food that is thrown away
I disagree	19.4%	18%	20%	15.3%
Neither do I agree / Neither do I disagree	25.3%	23.3%	24.0%	24.7%
I agree	55.3%	58.6%	56.0%	60.0%

When it comes to whether food packaging that ends up in our trash is a bigger environmental issue than food waste, participants said they consider discarded food packaging to be a big burden (48%) on the environment. The estimates are shown in more detail in the following graph.

Graph 4. Estimates of the environmental burden of food packaging



Finally, they were asked to state whether they recycle in general in their daily life and to what extent. The responses showed that 21.3% recycle everything that can be recycled, 30% recycle quite a bit, as recycling is not possible for all items. 34.0% recycle sometimes and 14.7% never.

Conclusion

The problem of food waste has taken on alarming proportions in recent decades with economic, social, and environmental implications.

Today's food supply chain is globalized. Food waste is a complex situation that affects all sectors of the food supply chain and consumers themselves. The only variation difference

is the different quantities at each stage of the chain. For modern societies, food waste is a major problem, exacerbated by the population's consumption behaviours in relation to food.

The EU has been working to expand and improve the measurement of food waste levels in order to guarantee that national initiatives to reduce food waste are supported by a strong evidence base and encourage the sharing of innovation and best practices. The updated Waste Framework Directive, which took effect on May 30, 2018, mandates that Member States monitor food waste levels, reduce food waste at every stage of the food supply chain, and report on their progress.

Reducing food waste by at least half by 2030 is one of the major goals set by the United Nations (UN) for Sustainable Development. Greece, among all European Union member countries, is committed to reducing food waste, as waste prevention is a key measure suggested by Circular Economy policies and European Green Agreement requirements.

Food waste and loss occur along the entire food supply chain, from food storage, transport, and processing to food shops, restaurant kitchens, hotels, and households. The problem of food waste is mainly caused by consumers whose tendency to buy food in larger quantities than necessary has now been a regular habit.

The empirical investigation, the convenience survey carried out in Greece in March 2022 showed that there is moderate knowledge about the dimensions of the problem of food waste with the main source of information being the Internet.

Only half of the survey participants estimates that food waste has got a direct impact on their income despite the fact that they check expiry dates of the food they buy. Also, it seems that Greek consumers knowingly and intentionally consumed food after the expiry date, and purchased food in damaged packaging provided that the content has not been visibly affected.

Food that is thrown away without being consumed falls into all categories (dairy, meat, bread, fruits & vegetables). The participants appear to make efforts to adopt management practices for efficient purchase planning and organisation, as the majority use a shopping list, and try to buy only the food list items.

Consumers seem to feel sorry when they throw away food, but at the same time they do not adopt behaviours related to sustainability.

It seems that individual/personal efforts to reduce household food waste are slightly stronger than the overall family effort.

According to the participants, they would reduce the food they throw/waste if they had better information. It seems that the information that consumers have on the issue of food waste is insufficient. Despite the fact that the country's economy has gone through a ten-year economic recession, consumers do not seem to have a piece of corresponding information about food waste that also affects their disposable income. Furthermore, a moderate degree of recycling in general is recorded.

Finally, it seems that the issue of food waste is known in Greece but there are big margins for informing consumers so the country will approach the European goals for reducing food waste.

References

- Aschemann-Witzel, J., de Hooge, I., Amani, P., Bech-Larsen, T., & Oostindjer, M. (2015). Consumer-related food waste: Causes and potential for action. *Sustainability* (Switzerland), 7(6), 6457–6477. <https://doi.org/10.3390/su7066457>

- Bamberg, S. (2003). How does environmental concern influence specific environmentally related behaviors? A new answer to an old question. *Journal of Environmental Psychology*, 23(1), 21-32.
- Barr, S. (2007). Factors influencing environmental attitudes and behaviors: A UK case study of household waste management. *Environment and behavior*, 39(4), 435-473.
- Bio Intelligence Service (2010). Preparatory study on food waste across EU 27. European Commission. http://ec.europa.eu/environment/eussd/pdf/bio_foodwaste_report.pdf
- Caldeira, C., De Laurentiis, V., Sala, S. 2019b. Assessment of food waste prevention actions: development of an evaluation framework to assess the performance of food waste prevention actions, EUR 29901 EN; Luxembourg (Luxembourg): Publications Office of the European Union; 2019, ISBN 978-92-76-12388-0, doi:10.2760/9773
- Canali, M., Östergren, K., Amani, P., Aramyan, L., Sijtsema, S., Korhonen, O Connor, C. (2014). Drivers of current food waste generation, threats of future increase and opportunities for reduction.
- Dunlap, R. E., Van Liere, K. D., Mertig, A. G., & Jones, R. E. (2000). New trends in measuring environmental attitudes: measuring endorsement of the new ecological paradigm: a revised NEP scale. *Journal of social issues*, 56(3), 425-442.
- European Commission 2018, Bioeconomy Strategy (EC, 2018b)
- European Commission, 2020, New Circular Economy Action Plan (EC, 2020b),
- European Commission, 2020, Farm to Fork Strategy (EC, 2020).
- European Commission, 2020, The Biodiversity Strategy for 2030 (EC, 2020c)
- EPRS. (2016). Tackling Food Waste: The EU's Contribution to a Global Issue Briefing.
- FUSIONS "Estimates of European food waste levels -Reducing food waste through social innovation", Stockholm 31 March 2016. ISBN 978-91-88319-01-2
- Garnett, T. (2008). *Cooking up a storm: Food, greenhouse gas emissions and our changing climate*. Surrey, UK: Food climate research network, Center for Environmental Strategy. http://www.fcrrn.org.uk/sites/default/files/CuaS_web.pdf
- Graham-Rowe, E., Jessop, D. C., & Sparks, P. (2015). Predicting household food waste reduction using an extended theory of planned behaviour. *Resources, Conservation and Recycling*, 101, 194-202.
- Gustavsson, J., Cederberg, C., Sonesson, U., van Otterdijk, R., Meybeck, A. (2011). *Global Food Losses and Food Waste: Extent Causes and Prevention*; Food and Agriculture Organization of the United Nations (FAO): Rome, Italy, pp. 1–37. <http://www.fao.org/3/mb060e/mb060e.pdf>
- Hall, K., Guo J., Dore M., Chow C., 2009, The Progressive Increase of Food Waste in America and Its Environmental Impact, Published: November 25, 2009 at <https://doi.org/10.1371/journal.pone.0007940>
- Kemna, R., van Holsteijn, F., Lee, P., Sims, E., 2017. Optimal Food Storage Conditions in Refrigeration Appliances. Preparatory/review Study on Commission Regulation (EC) No. 643/2009 and Commission Delegated Regulation (EU) No. 1060/2010 – Complementary Research on Optimal Food Storage Conditions in Refriger. Available at: <https://www.vhk.nl/downloads/Reports/2017/VHK%20563%20>

- FINAL%20REPORT%20Optimal%20food%20 storage%20conditions%20 in%20refrigeration%20appliances%20VHK%2020170217.pdf.
- Lundqvist, J., de Fraiture, C., & Molden, D. (2008). Saving water: from field to fork: curbing losses and wastage in the food chain: Stockholm International Water Institute Stockholm, Sweden.
- Newsome R, Balestrini Ch., Mitzi D. Baum, Corby J., Fisher. W, Kaarin Goodburn K., Labuza Th., Gale Prince, Hilary S. Thesmar H., Frank Yiannas (2014) Applications and Perceptions of Date Labeling of Food, Comprehensive Reviews in Food Science and Food Safety, Volume 13, Issue 4 Pages: 347-769, July 2014
- Pitoska E. & Grana V., (2021), "Food waste in Greece: an empirical study", <https://equinocs.springernature.com/>
- Electra Pitoska & Grana Vaya (2022) "Food waste in Greece: an empirical study", Presented at International Conference on Applied Economics ICOAE 2022, 7-9 Jul 2022, Madrid, Spain
- Quested, T., Marsh, E., Stunell, D., & Parry, A. (2013). Spaghetti soup: The complex world of food waste behaviours. *Resources, Conservation and Recycling*, 79, 43-51.
- Radzyminska, M., Jakubowska, D., & Staniewska, K. (2016). Consumer attitude and behaviour towards food waste. *Journal of Agribusiness and Rural Development* (01 [29]).
- Russell, S., Young, C. W., Hardin, K., & Robinson, C. (2017). Bringing Habits and Emotions into Food Waste Behaviour. *Resources, Conservation and Recycling*. <https://doi.org/10.1016/j.resconrec.2017.06.007>
- Schultz, P. W., & Zelezny, L. (1999). Values as predictors of environmental attitudes: Evidence for consistency across 14 countries. *Journal of Environmental Psychology*, 19(3), 255-265.
- Stenmarck, A. s., Jensen, C., Quested, T., Moates, G., Buksti, M., Cseh, B. z., Redlingshofer, B. (2016). Estimates of European food waste levels: IVL Swedish Environmental Research Institute. 146
- Swami, V., Chamorro-Premuzic, T., Snelgar, R., & Furnham, A. (2011). Personality, individual differences, and demographic antecedents of self-reported household waste management behaviours. *Journal of Environmental Psychology*, 31(1), 21-26.
- United Nations – Food and Agriculture Organization, Sustainable Development Goals, <https://www.fao.org/sustainable-development-goals/indicators/1231/en/>
- Van Boxtael, S., Devlieghere, F., Berkvens, D., Vermeulen, A., & Uyttendaele, M. (2014). Understanding and attitude regarding the shelf life labels and dates on pre-packed food products by Belgian consumers. *Food Control*, 37, 85-92.
- Worldwide Fund for Nature (2020). "Measures to reduce food losses" <http://contentarchive.wwf.gr/images/pdfs/food-waste-measures.pdf>.
- Wrzosek, M., Kołożyn-Krajewska, D., & Krajewski, K. (2012). Nieracjonal new Ykorzystanież wnościperspek tywa globalna iodpowiedzia lnoścspołecznej, Prace Student ówi Młodych Pracowników Nauki.Teoriai praktyka zarządzania przedsiębiorstwem. Wybranezagadnienia 59-72. (Irrational New Use of Resources, Global Perspective and Social Responsibility, Works by Students and Young Scientists. Theory and Practice of Enterprise Management. Selected Issues)