



Save Food. Waste less.
Τέρμα στη σπατάλη τροφίμων!

Awareness-raising campaign to prevent and manage food waste among consumers, the food and hospitality industries

Brief report - March 2021



LIFE19 GIE/CY/001166

FOODprint project is co-funded by the LIFE Programme of the European Union



@foodprintcy



Globally, roughly a third of all food produced for human consumption is lost or wasted-approximately 1.3 billion tonnes. Food losses and waste amounts to roughly US\$ 680 billion in industrialized countries and US\$ 310 billion in developing countries in economic losses, while social and environmental losses amount to US\$ 900 billion and US\$ 700 billion respectively¹.

Source: IFCO²

Wastage of food presents an ethical issue too: According to the FAO World Hunger map of 2015 FAO reports that about 793 million people in the world are malnourished.³ According to Eurostat, 55 million people (9.6% of the EU's population), were unable to afford a quality meal every second day in 2014⁴.

Other than the economic and ethical problems raised food waste also poses a significant environmental problem. Food wasted is not only the waste of valuable and often scarce resources such as water, soil, and energy but it also contributes to climate change. According to the UN's Food and Agricultural Organization (FAO), food waste has a global carbon footprint of about 8% of



all global greenhouse gas emissions caused by humans. For every kilogram of food produced, 4.5 kilograms of CO₂ are released into the atmosphere⁵.

¹ Stop Wasting Food. n.d. Stop Wasting Food. [online] Available at: <<https://stopwastingfoodmovement.org/food-waste/food-waste-facts>> [Accessed 28 November 2020].

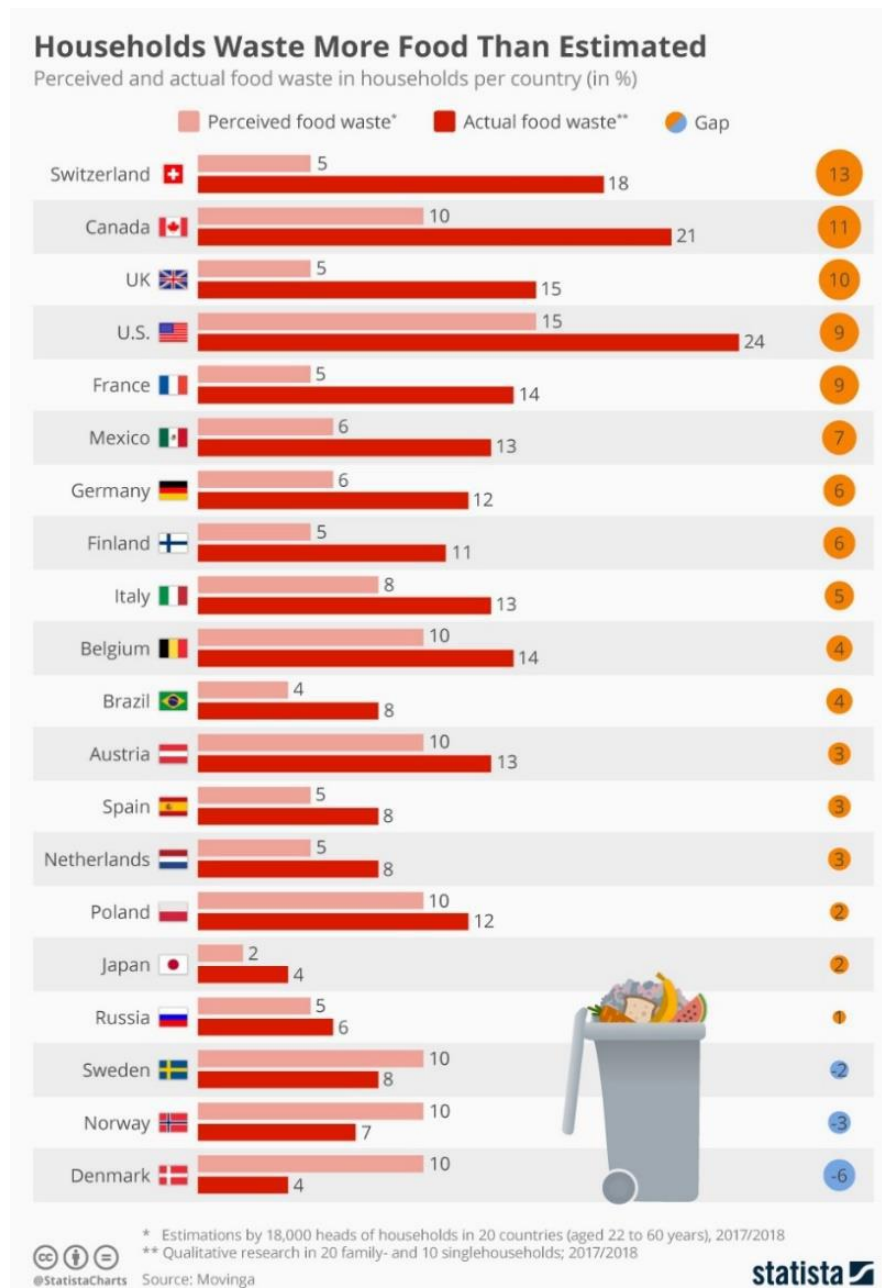
² <https://www.ifco.com/countries-with-the-least-and-most-food-waste/>

³ FAO Hunger map 2015 . <https://www.fao.org/3/i4674e/i4674e.pdf>

⁴ FAOHome. n.d. Home | Food and Agriculture Organization of the United Nations. [online] Available at: <<https://www.fao.org/home/en/>> [Accessed 29 November 2020].

⁵ FAOHome. n.d. Home | Food and Agriculture Organization of the United Nations. [online] Available at: <<https://www.fao.org/home/en/>> [Accessed 29 November 2020].

International research reveals that the food waste problem is underestimated by the consumers. Globally, people perceive that the food waste problem is smaller than it actually is. The Figure below is indicative of this fallacy at the level of the households. Besides the Scandinavians, in most of the other countries surveyed (and especially the more affluent countries) there is a significant lack of appreciation of the scale of the problem by the public.



Source: Statista.com



The per capita production of food waste widely differs between members states. Cyprus is among the top food waste producers in the EU. To a certain extent, this is attributed to the touristic nature of the country. Cyprus used to accept (prior to the pandemic), close to 4 million tourists per year, a very high number compared to the 850,000 of the local population. These tourists have a definite impact on the total food waste production; hence the calculation of the per capita production is inflated.

Food is lost and wasted along the whole supply chain from farms to processing and manufacturing to shops, restaurants and at home. In terms of the quantities of food wasted it is estimated that 53% occurs in households, 19% in food processing, 12% in food service/catering, 11% in primary production and 5% in retail/wholesale of food.

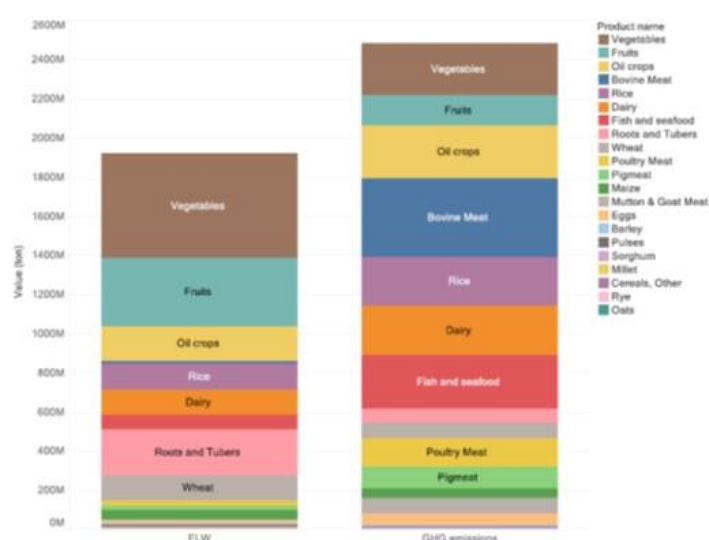
When looking at environmental impacts however, it is estimated that 73% of GHG emissions related to food waste are derived from food production, 6% from food processing activities, 7% from retail and distribution, 8% food consumption and 6% from food disposal. Animal containing food such as meat and dairy food have the highest environmental impacts of food waste in terms of global warming potential, acidification potential and eutrophication potential.⁶

The EU and its Member States are committed to meeting Sustainable Development Goal (SDG) 12.3 to decrease per capita food waste by 50% at the retail and consumer level by 2030 and to reduce food losses along the food production and supply chains.

Source: europarl.europa.eu. 2020

⁶ Scherhauer, Silvia et al. 2018. "Environmental Impacts Of Food Waste In Europe" 77: 98-113. doi: <https://doi.org/10.1016/j.wasman.2018.04.038>.

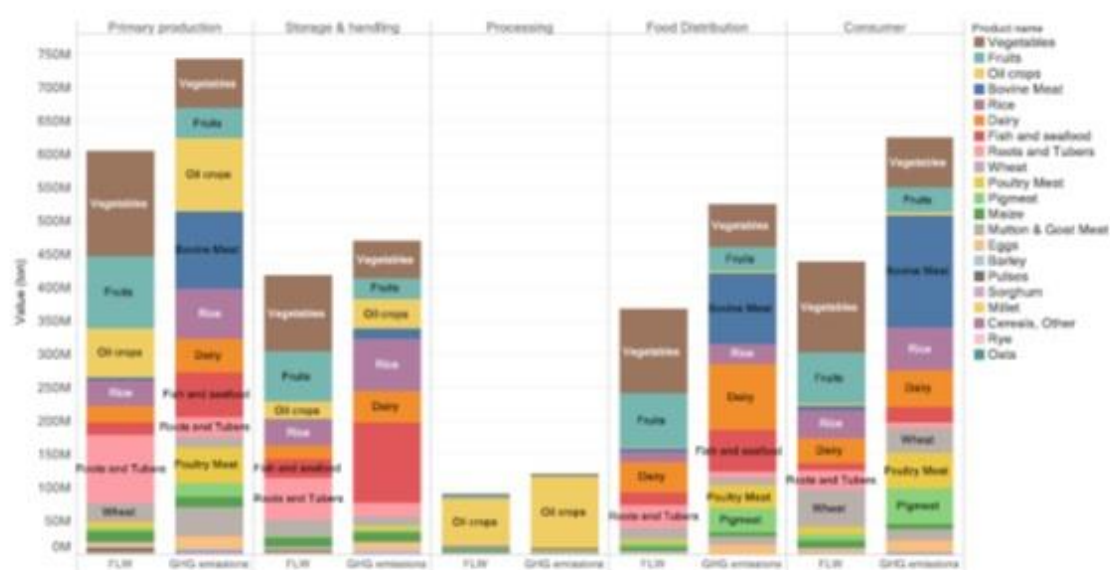
According to a very recent study on hotspots for food waste production⁷, vegetables and fruits contributed the most to food loss and waste, accounting for almost half of the total food loss and waste. These are demonstrated in the figure below.



Global hotspots for FLW and associated GHG emissions in 2017.

Source: Guo et al., 2020

For example, bovine meat is contributing very little to total food losses and waste (only for 0.7% of the total), but it has the largest contribution for the food losses and waste associated to GHG emissions and contributed as much as vegetables and fruits combined (16.3%). The same study investigated food losses and waste and associated GHG emissions per chain stage of the food production and consumption, the results of which are shown in the figure below.



Global hotspots for FLW and associated GHG emissions by chain stage in 2017.

Source: Guo et al., 2020

⁷ Guo, Xuezheng & Broeze, Jan & Groot, Jim & Axmann, Heike & Vollebregt, H.M. (2020). A Worldwide Hotspot Analysis on Food Loss and Waste, Associated Greenhouse Gas Emissions, and Protein Losses. Sustainability. 12. 7488. 10.3390/su12187488

The results demonstrate that primary production and consumer stages yielded slightly higher food loss and waste associated GHG emissions than the storage and handling and food distribution stages. The processing stage generated much lower food losses and waste associated GHG emissions compared to other stages. Bovine meat in this case, is mostly contributing to food losses and waste associated GHG emissions at the consumer stage.

Circular Economy Package

In addition to existing Directives and Regulations, the European Union has been working hard to promote a sustainable agenda. The two most important recent policy initiatives towards that direction, have been:

- The Circular Economy Package in 2018, with an aim to boost competitiveness, create jobs and generate sustainable growth
- The EU Green Deal in 2019, a green and inclusive transition to help improve people's well-being and secure a healthy planet for generations to come

According to the Commission, it has adopted an ambitious Circular Economy Package (CEP) with the aim to help EU businesses and consumers make the transition to a stronger and more circular economy where resources are used in a more sustainable way. The actions proposed in the CEP will contribute to "closing the loop" of product lifecycles through greater recycling and re-use of resources and achieve benefits for both the environment and the economy. The prevailing philosophy behind this initiative, is the need to ensure better resource efficiency and derive maximum value from the resources we utilise through repeated cycle lives⁸.

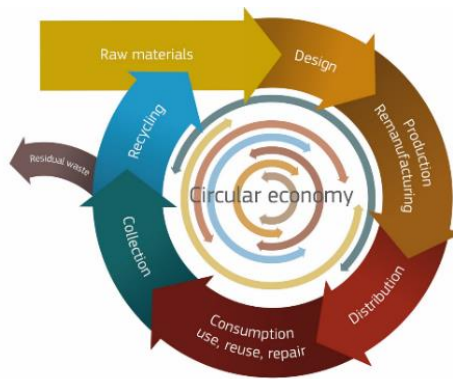
The CEP, aims to drive the EU economy from a linear model:



Source: First circular economy action plan, 2020

To a circular model:

⁸ "Closing The Loop: Commission Adopts Ambitious New Circular Economy Package To Boost Competitiveness, Create Jobs And Generate Sustainable Growth". 2015. https://ec.europa.eu/commission/presscorner/detail/en/IP_15_6203.



Circular Economy Package – EU

Source: First circular economy action plan, 2020

The European Green Deal

In 2019, the EU Commission released the EU Green Deal, which sets the basis of the ambitious vision of the European Union in dealing with climate change. The environmental risks are eminent, the atmosphere is warming, and the climate is changing with each passing year. One million of the eight million species on the planet are at risk of being lost. Forests and oceans are being polluted and destroyed⁹.

The European Green Deal is a response to these challenges. It is a new growth strategy that aims to transform the EU into a fair and prosperous society, with a modern, resource-efficient and competitive economy where there are no net emissions of greenhouse gases in 2050 and where economic growth is decoupled from resource use¹⁰. It also aims to protect, conserve, and enhance the EU's natural capital, and protect the health and well-being of citizens from environment-related risks and impacts.

To deliver the European Green Deal, there is a need to rethink policies for clean energy supply across the economy, industry, production and consumption, large-scale infrastructure, transport, food, and agriculture and other. For food and agriculture, the Green Deal proposes the strategy from 'Farm to Fork'.¹¹

⁹ "COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE EUROPEAN COUNCIL, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS - The European Green Deal". 2019. Brussels : European Commission. https://eur-lex.europa.eu/resource.html?uri=cellar:b828d165-1c22-11ea-8c1f-01aa75ed71a1.0002.02/DOC_1&format=PDF

¹⁰ "COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE EUROPEAN COUNCIL, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS - The European Green Deal". 2019. Brussels : European Commission. https://eur-lex.europa.eu/resource.html?uri=cellar:b828d165-1c22-11ea-8c1f-01aa75ed71a1.0002.02/DOC_1&format=PDF

¹¹ "COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE EUROPEAN COUNCIL, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS - The European Green Deal". 2019. Brussels : European Commission. https://eur-lex.europa.eu/resource.html?uri=cellar:b828d165-1c22-11ea-8c1f-01aa75ed71a1.0002.02/DOC_1&format=PDF



Farm to Fork- EU

Source: Farm to Fork Strategy, 2020

The Farm to Fork Strategy is at the heart of the European Green Deal aiming to design a fair, healthy and environmentally friendly food system for all.

Food Waste in Cyprus

The Cypriot production of household waste per capita is among the highest in Europe. According to the Statistical Service of the Republic of Cyprus in 2018 the waste generation reached 640 kg per capita, placing Cyprus third only to Denmark and Malta. The EU average is 482 kg per capita, a third of which (i.e., 88 million tons) is Food Waste. This also means that one third of food produced for human consumption in the world is lost or wasted, while one out of nine people globally is malnourished.



Based on the available data and considering that 60% of biodegradable waste is estimated to be food waste, we can estimate that in 2017 about 155,000 tonnes of food waste was generated in Cyprus, representing 28,2% of total municipal solid waste generated for the same year.

Consequently, almost one third of the infrastructure and operational cost for waste management in Cyprus, is expensed to deal with food waste. Wasting food is not only an ethical and economic issue but also depletes the environment of limited natural resources. In Cyprus, it is estimated that the solid waste in general contributes around 14% of the Cyprus GHG emissions (National Plan for Energy & Climate 2021-2030). Therefore, minimizing food waste will have an important positive impact on GHG emissions.



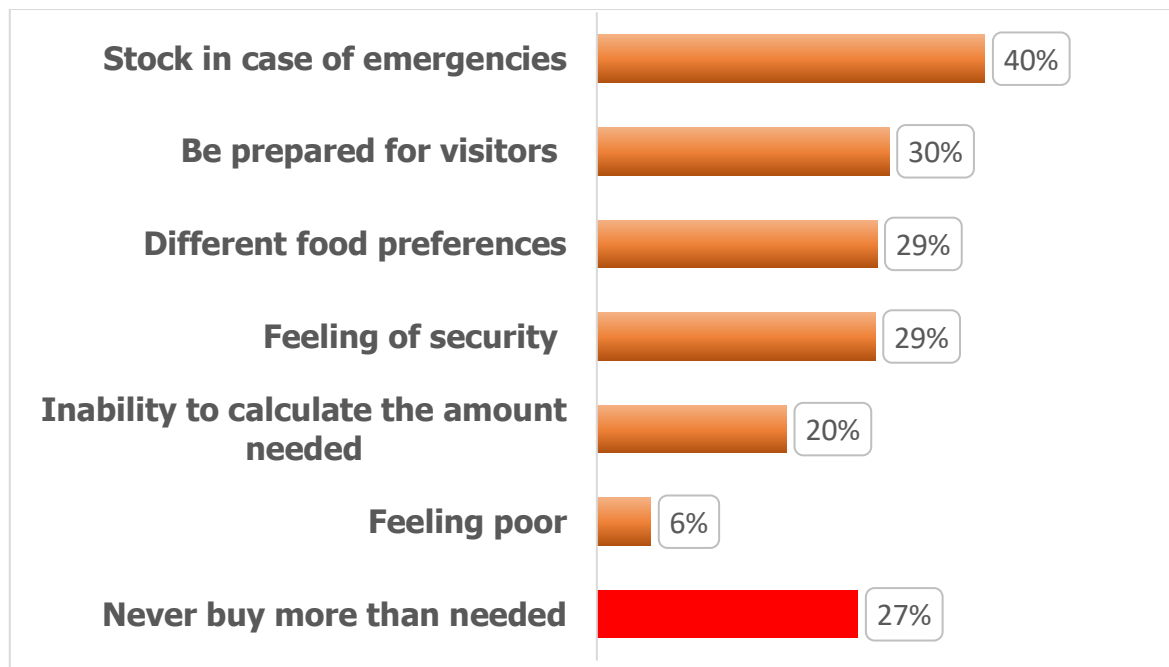
Public Opinion Surveys - Cyprus

Three quantitative surveys were conducted during the period October 2020 to January 2021. The main survey covered 554 people aged 18 and over, who are either responsible for household shopping or food preparation run in the period 21 – 23 October 2020. The geographical distribution of the sample was proportional to the actual distribution of the population. The data was not weighted during processing. The second, was a shorter online questionnaire via the Dias group websites with a larger sample (total 1828 participants, out of which 1104 with complete answers) and participation from other countries (Greece, UK, other) between 05/11 and 09/11/2020. A third online survey with a smaller sample (total 1432 participants, out of which 943 with complete answers) was performed during 13/1 – 18/1/21.

The highlights of the surveys were the following:

Buying more food than needed (1st survey)

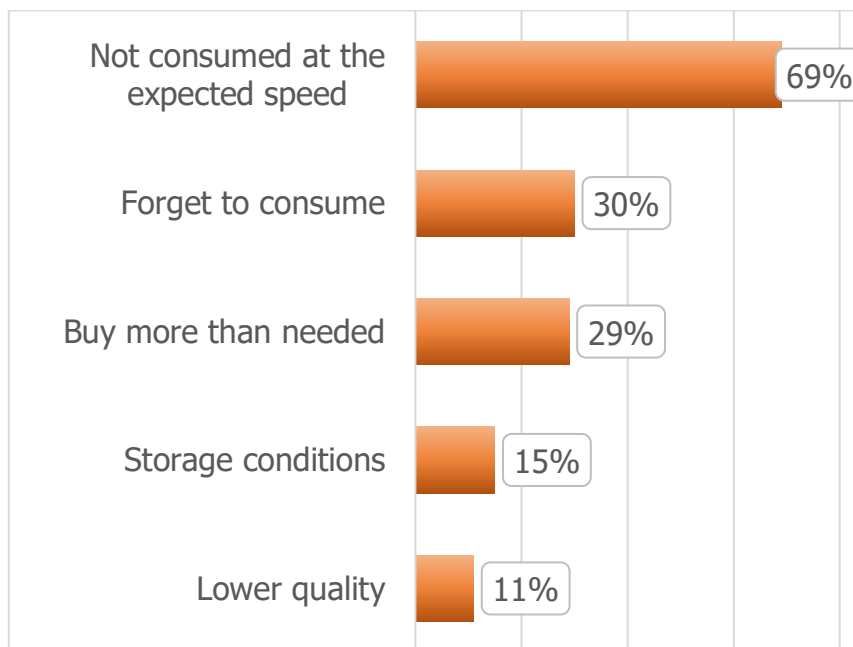
Seven out of ten consumers tend to buy more than the required quantities of food. These habits may root back into concerns of security among the population.



Buying more food than needed

Food waste generation reasons (1st survey)

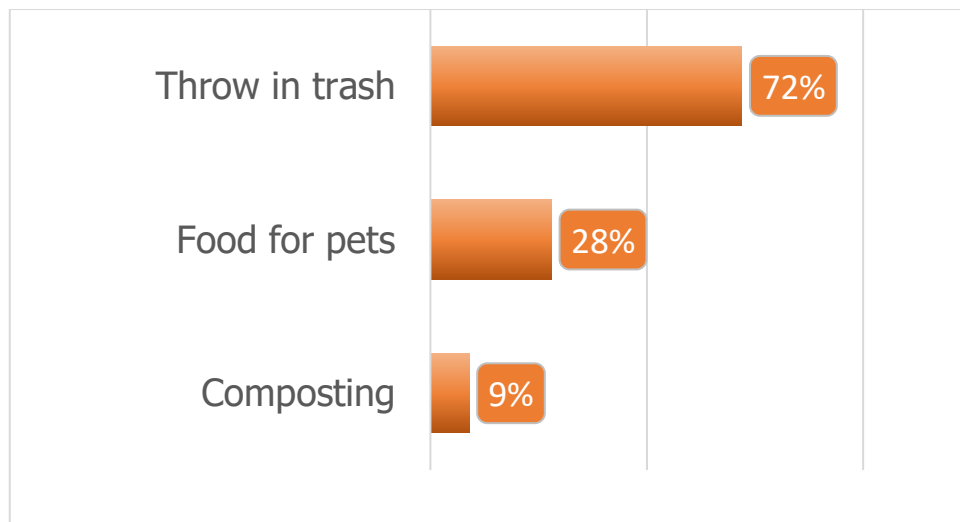
The main reason food is wasted is because it is not consumed at the expected rate, which is reported to a much greater extent by all participants in the research. To a lesser extent, consumers report that they forget to consume food and that they buy more than they need.



Food waste generation reasons

Food waste management (1st survey)

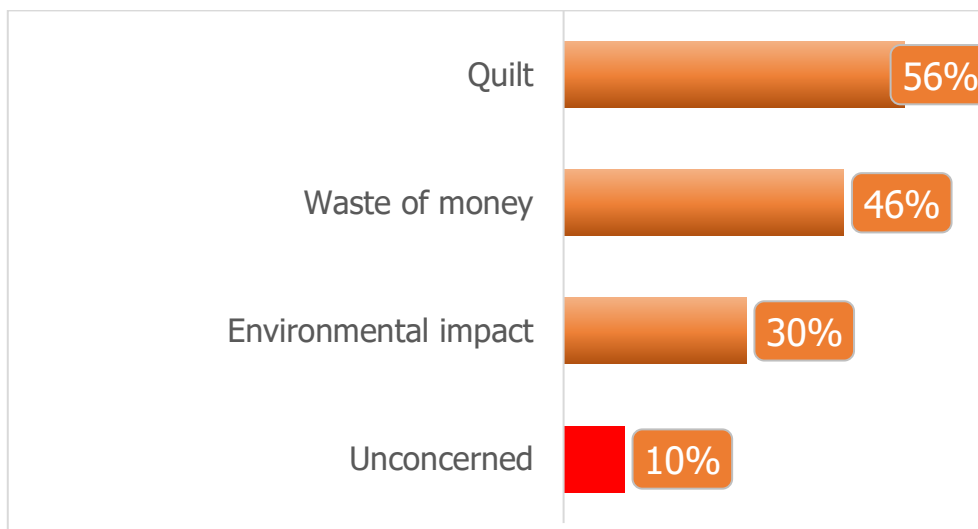
Most consumers throw away the food they consider unsuitable for consumption (72%). Three out of ten give this food to pets, while much fewer report that they compost it.



Food waste management

Feelings when wasting Food (1st survey)

The main feeling of consumers when throwing food away, is a feeling of guilt (56%), secondly that of waste of money (46%) and thirdly of concerns for the Environmental impact (30%). One out of ten is completely indifferent.



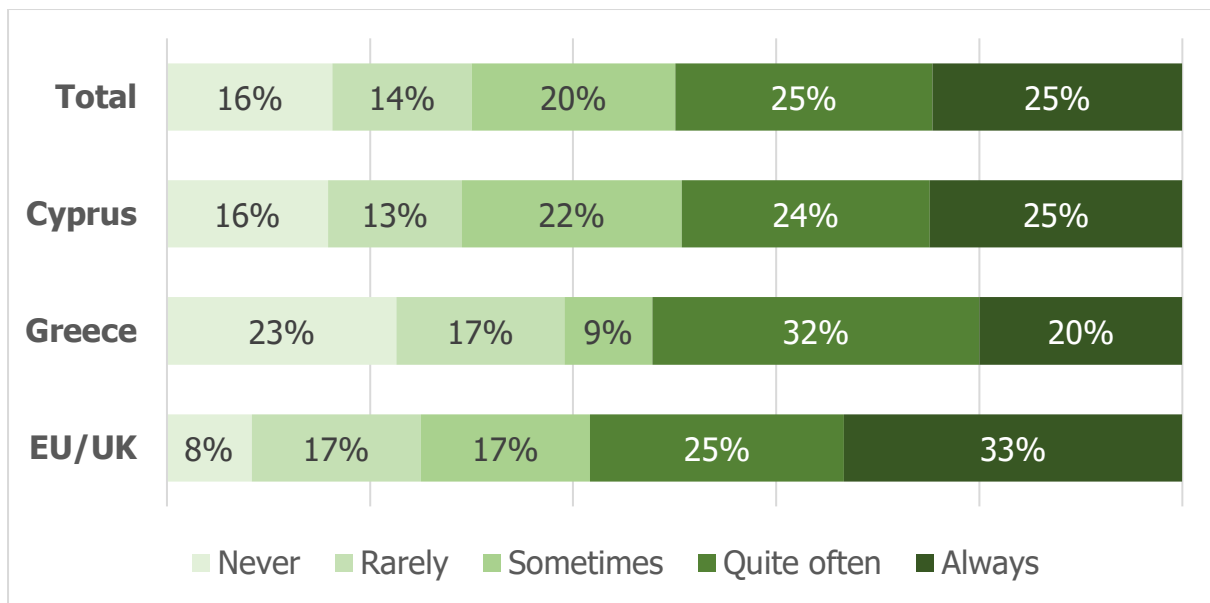
Feelings when wasting Food

Taking food leftover from outings (opinions Vs actions) (2nd survey)

The next question was aimed to measuring deviations between claims of importance of taking food leftover from outings and the real behaviors. In the whole sample, only 25% always take food leftovers from outings, 25% do it quite often, 20% do it sometimes and 30% do it rarely or never.

The habit of taking food leftover from outings, is more common among those living in other EU countries and the United Kingdom than among those participated from Cyprus or Greece.

Among the participants from Cyprus, 18% of them consider it very important to take with them food that is left over after eating out, but do not always do so. Among participants from Greece, it amounts to 16% and among participants from other EU countries and the UK it amounts to 14%.



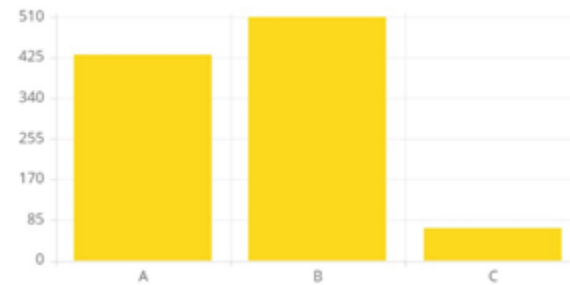
Taking Food Leftover from outings

Percentage of food in household waste (3rd survey)

Almost half of the participants underestimate the problem of food waste production in their household as they consider that their production is less than the average household.

# ^	ANSWER	COUNT	%
A	Less	431	42.7%
B	Same Level	510	50.5%
C	More	68	6.7%

1,009 total respondents.



Percentage of food in household waste

Best practices to prevent food waste

What can consumers do to reduce their food waste? There are several solutions which if implemented can bring benefits such as money savings, more equity by improving the distribution of food among the society and reduction of the environmental impact of food and food waste.

Planning, prepping, and storing food can help your household waste less food. Below are some tips to help you do just that:

HOW TO REDUCE FOOD WASTE



SHOP SMART
Check what you have at home before you shop, and only buy as much as you need.



SMALLER PORTIONS
Make smaller portions at home; at restaurants, share large portions.



BUY 'UGLY' PRODUCE
Not all fruits and vegetables are pretty, they will still taste good though



DONATE
If you have too much of something, share it, there are food banks or smaller initiatives to feed people in most cities.



KNOW YOUR DATES
"Use by" is the date by which food needs to be consumed. "Best before" means the food is best before that date, but can still be safe after that.



ORGANIZE THE FRIDGE
When you put new food into your fridge, move older items up to the front and tuck the new ones in the back.



SAVE LEFTOVERS
Save leftovers for other meals or repurpose in another dish



COMPOST
Compost your scraps, your garden will thank you.



@AJLabs
Source: FAO, UN | October 16, 2019



ALJAZEERA

Source: FAO, UN, 2019

There are various initiatives implemented in different countries or regions that promote alternative ways to better manage food and to minimize food waste. Some examples of such initiatives are presented below:



'Boroume' is a non-profit organisation whose goal is to reduce food waste and fight malnutrition by increasing food donation in Greece with the support of volunteers, partners and friends of the organisation. The organisation approaches the food waste problem and the fight against food insecurity holistically through a various programs such as 'Saving & Offering Food', 'Awareness Program – Every meal matters' and 'We are Family'.

Until today the organisation has saved 58.000.000 portions of food with a value of €116.000.000. Everyday a number of 30.000 portions of food are saved and offered to those in need. From an environmental perspective, 670 tonnes of fruits and vegetables have been saved and offered to local's charities. The organisation currently collaborates with over 650 charitable organisations, soup kitchens and municipal social services.

The organisation aims to increase awareness by educating children with interactive classroom activities about the value of food waste, volunteering and donating in order to develop a responsible society that cares for the environment and society. 'Boroume' organization is an active member of the Saving Food program which is funded by the European Union's Horizon 2020 operational research and innovation program¹².



Rescuedbox mission is to tackle food waste and become part of the solution. Their aim is to do that by rescuing 500 tones of food waste by 2022. Rescuedbox works closely with the local farmers' cooperatives to deliver only the freshest produce to the subscriber's door. From their recyclable boxes to the recyclable tape, they use to wrap them, they do their best to avoid plastic. Each week they optimise the delivery routes away from traffic to reduce the carbon footprint. At the moment (March 2022) Rescuedbox has managed to "rescue" more than 176 tonnes of food waste. Their ultimate goal is building a community of Rescue warriors that are mindful and concerned about the environment and want to join them in their mission¹³.

¹² <https://www.boroume.gr/en>

¹³ <https://rescuedbox.com/>

✓ Local ✓ Fresh ✓ Free Delivery ✓ Cancel anytime

Monday | Tuesday Deliveries

Small



Rescue up to 3 types of fruits & up to 7 varieties of veggies (perfect for individuals or couples). Approximately 5-6kg

Medium



Rescue up to 4 types of fruits & up to 8 varieties of veggies (perfect for 2-3 people). Approximately 7-8kg

Large



Rescue up to 4 types of fruits and up to 9 varieties of veggies (perfect for families of 4-5). Approximately 9-10kg



The Food Waste Reduction Alliance (FWRA) is a joint industry collaborative focused on reducing food waste in the USA. It was launched in 2011 by the collaboration of the Grocery Manufacturers Association, the Food Marketing Institute, and the National Restaurant Association, in order to reduce food waste at its source, increase donations to food banks and decrease the amount of food sent to landfills.

FWRA brings together businesses from different stages along the food supply chain such as the manufacturing, retail, and restaurant industries, as well as expert partners from the anti-hunger and solution provider sectors. The FWRA has 3 main objectives: i) to reduce food waste, ii) to increase the quality of donated food and iii) to prioritise recycling of food waste. More than 30 companies have joined the effort and are actively seeking solutions to this challenge.

Studies on food waste amounts and food waste diversion among manufacturers, retailers and restaurants are conducted to analyse the progress and to become aware of new challenges.

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¹⁴ Definition of best practice activities in food waste prevention and management – Interreg Central Europe STREFOWA, (2016).



Food Waste Reduction Alliance 3 goals

Source: foodwastealliance.org

In order to achieve the goals, set, the FWRA follows the Food Recovery Hierarchy:



Food Recovery Hierarchy

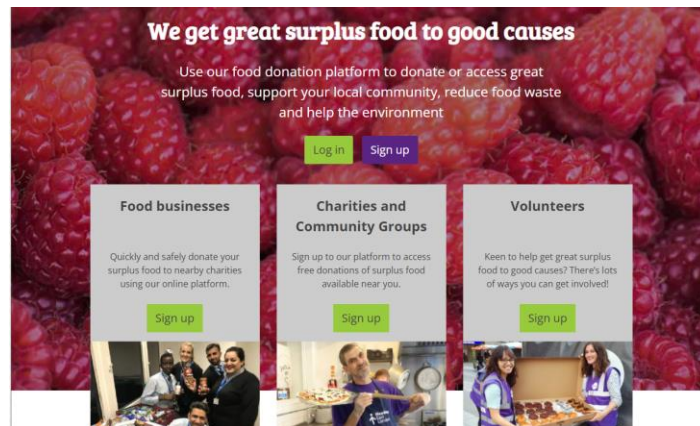
Source: foodwastealliance.org

The hierarchy followed is similar to the EU food waste hierarchy. Firstly, food waste must be prevented by reducing demand for excess food, then any leftovers should be donated to others in need, and any other remaining leftover food be given to animals. Any material not suitable for feeding people can be used by the industry, composted and landfilled/incinerated.



The Zero Food Waste Heroes [United Kingdom]

Plan Zheroes is a charitable incorporated organisation based in London which supports over 500 charities by connecting food businesses that kindly donate their surplus food with people who experience food poverty. For 2021, Plan Zheroes saved 59 tonnes of food through their free online donation platform, from grocery markets and other offline donations. This means that almost 150.000 meals were saved and went to those in need as well as 230 tons of CO₂ (Carbon dioxide) emissions saved.



The organisation from its first year of operation until today managed to save over 500 tonnes of surplus food, provided over 1 million meals and over 2000 tonnes of CO₂ emissions have been saved. The success of the organisation is based on the continuous help of volunteers by offering surplus food and help with the collection and delivery. The organisation has managed to expand its operation in other UK locations¹⁵.



[France, Italy, Malta, Spain]

LIFE FOSTER project aims to reduce food waste in the restaurant industry by raising awareness about food waste and the optimal food storage methods through training and education of service professionals, trainers, educators, students and citizens. The project is co – funded by the EU Commission Life Programme and is implemented in France, Italy, Malta and Spain¹⁶. The project aims to reach 70 VET educational centers, 7,000 students, 500 trainers, 200 policy makers, 3,600 companies and 10,000 professionals.

One of the initiatives of the project is the development of an innovative tool that measures food waste in the catering sector¹⁷. The purpose of this application named 'Food Waste Flow Balance' is to allow restaurant owners to measure their food waste during their work process until the final dish. The aim of the app is to prevent food waste by measuring it! The app was developed by the University of Gastronomic Science with the technical support of DGS digital development.

¹⁵ <https://planzheroes.org/>

¹⁶ <https://www.lifefoster.eu/summary/>

¹⁷ <https://www.lifefoster.eu/reduce-waste/>



HERE ARE SOME OF THE MAIN FUNCTIONS OF THE WEB APPLICATION:

- Quantifying food waste and its value during all phases (receipt and storage of goods, food preparation, cooking and service);
- Classifying and quantifying food waste according to the category of the product;
- Measuring the proportions of edible and non-edible waste;
- Measuring energy and water consumption associated with the preparation;
- Comparing different menus/meals in terms of waste production;
- Measuring the recovery rate of the surplus product;
- Monitoring food waste trends over time.

In November 2020, 15 vocational training centers in the 4 countries involved in the LIFE FOSTER project started to use and experiment with the app in their workshops, involving trainers, tutors and students.

Why don't you waste less by adopting circular economy strategies? All you need is a scale and the FOOD WASTE FLOW BALANCE App to measure and prevent food waste!



The LIFE Climate Smart Chefs project focuses on training and educating European chefs and helps them to become active sustainable changemakers and promoters of low emission, nutritious and affordable diets in the EU. During its implementation, 160 Chefs were trained on sustainable and healthy diets, 1 million stakeholders in the food industry were informed and 10 million European citizens were informed about the project¹⁸.

One of the objectives of the project is the development of the 'Climate Smart Menu' tool for helping chefs calculate combined health and sustainability impact of their menus.

The project is co-funded by the LIFE programme of the EU and aims to contribute to the development and implementation of the EU Climate Policy and the Farm to Fork (F2F) Strategy.



Matching Excess and Needs for Stability (MEANS) [USA]

MEANS is an organisation that developed a free online platform which connects anyone with excess food, like grocery stores, businesses etc., with nearby emergency food providers like charities, soup kitchens and shelters who serve to those in need¹⁹. The organisation aims to reduce food waste and reroute the surplus food to people facing food insecurity. Since 2015 that the organisation launched their database, it has helped to save 3.6 million kg of food, and provided 549,046 meals in 50 states and District of Colombia. The database counts 3000+ users.

¹⁸ <https://climatesmartchefs.eu/theproject/>

¹⁹ <https://meansdatabase.org/our-story/>



[Malaysia]

The Lost Food Project (TLFP) is a non – profit organisation located in Malaysia and it focuses on preventing surplus food that is still nutritious yet unwanted, from going to landfills and reroute it to those who are in need regardless of gender, religion, age, disability or ethnic group. The organisation saves on average 10 tonnes of good quality surplus food per week from supermarkets, manufacturers and markets and provides on average 33.000 meals per week to charity organisations. TLFP managed to save 2.713.428 kg of surplus food, provided 8.766.133 meals and prevented 6.783.571 kg of CO2 emissions²⁰.



[USA]²¹FOODCYCLE LA

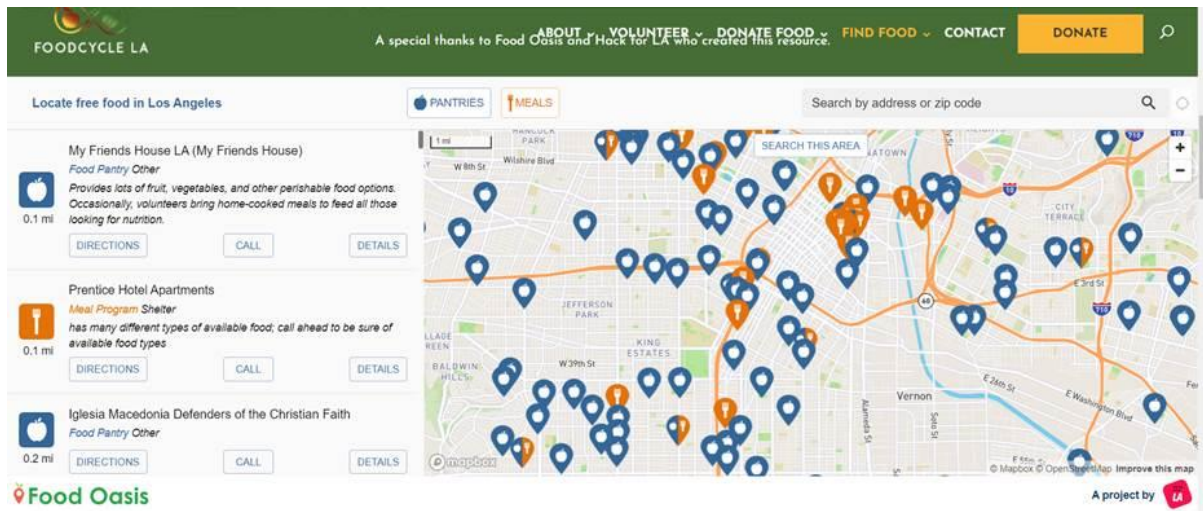
Food cycle LA is a non- profit organisation that works to reduce landfill gas emissions by partnering with local food retailers to prevent food waste in Los Angeles. FoodCycle LA recovers and diverts surplus food to communities experiencing food insecurity. They partner with food retailers to reroute surplus food away from landfills to organizations working to feed hungry people by introducing innovative technology into the food recovery space. Currently they partner with 230 community – based organisations to maximise their impact and working with donors throughout LA to connect food with over 160 nonprofits that are feeding people.

The organisation collaborated with Food Oasis and developed a database (Food Oasis Map) of organisations that offer food to those in need so they can move resources into food deserts of LA where the need is greatest. To help the process, the organisation introduced the “Careit App” to increase their impact and better recover and route the excess food. For the delivery of the excess food, they use electric vehicles and to pick up small food donation portions they involve their volunteers.

How the app works; When a donor has food they would like recovered, the app sends out a notification to volunteers based on their notification preferences and location. Drivers are then able to accept the donation if they like, and they’ll be smartly paired with a nearby recipient. Alternatively, a volunteer can turn off notifications and pop on to the app whenever it’s convenient to see what donations are currently available for pickup. They’re able to choose one or more as they like, based on their preferences. It also sets up schedules for the ongoing partner donors and volunteers, for those interested.

²⁰ <https://www.thelostfoodproject.org/>

²¹ <https://www.foodcyclela.org/about-us/>



The project is funded by a grant from the Department of Resources Recycling and Recovery (CalRecycle) through California Climate Investments.



Stop Food Waste project is an Irish national awareness campaign that provides tips and information on how to make the most of the food and how to avoid food waste. The project is managed by the Environmental Protection Agency.



The National Food Chain Safety Office (NFCO/NÉBIH) recognised the need to reduce food waste in Hungary and started this program (WASTEless) with the financial support of LIFE's European Union Programme. The project's aims were to raise public awareness mainly through educating primary school children. By the end of the project, 10.000 primary school children and 800 teachers were reached and informed about the food waste problem.²²



FOOD RESCUE is a European project that educates the young generation as an essential element of the global response to climate change through development of innovative teaching and educational packages for primary students based on food waste as a conceptual context. The project implementation started in February 2022 and will end by July 2024. The aim of the project is to encourage social mindfulness and responsibility regarding food waste. The earlier students are educated about environmental issues, the more sustainable their

²² <https://maradeknelkul.hu/en/about-wasteless/>

behaviors will become. FOOD RESCUE is an Erasmus+ KA2- Cooperation partnerships in school education²³.

²³ <https://foodrescue-project.eu/about-us/>