



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



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@foodprintcy

Globally, roughly a third of all food produced for human consumption is lost or wasted- approximately 1.9 billion tons. 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.

There is also the ethical aspect: FAO reports that about 793 million people in the world are malnourished. According to Eurostat, 55 million people (9.6% of the EU's population), were unable to afford a quality meal every second day in 2014².



Source: FAO, UN

Food waste does not only mean that valuable and often scarce resources such as water, soil, and energy are being lost, 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 kilo of food produced, 4.5 kilos of CO₂ are released into the atmosphere³.



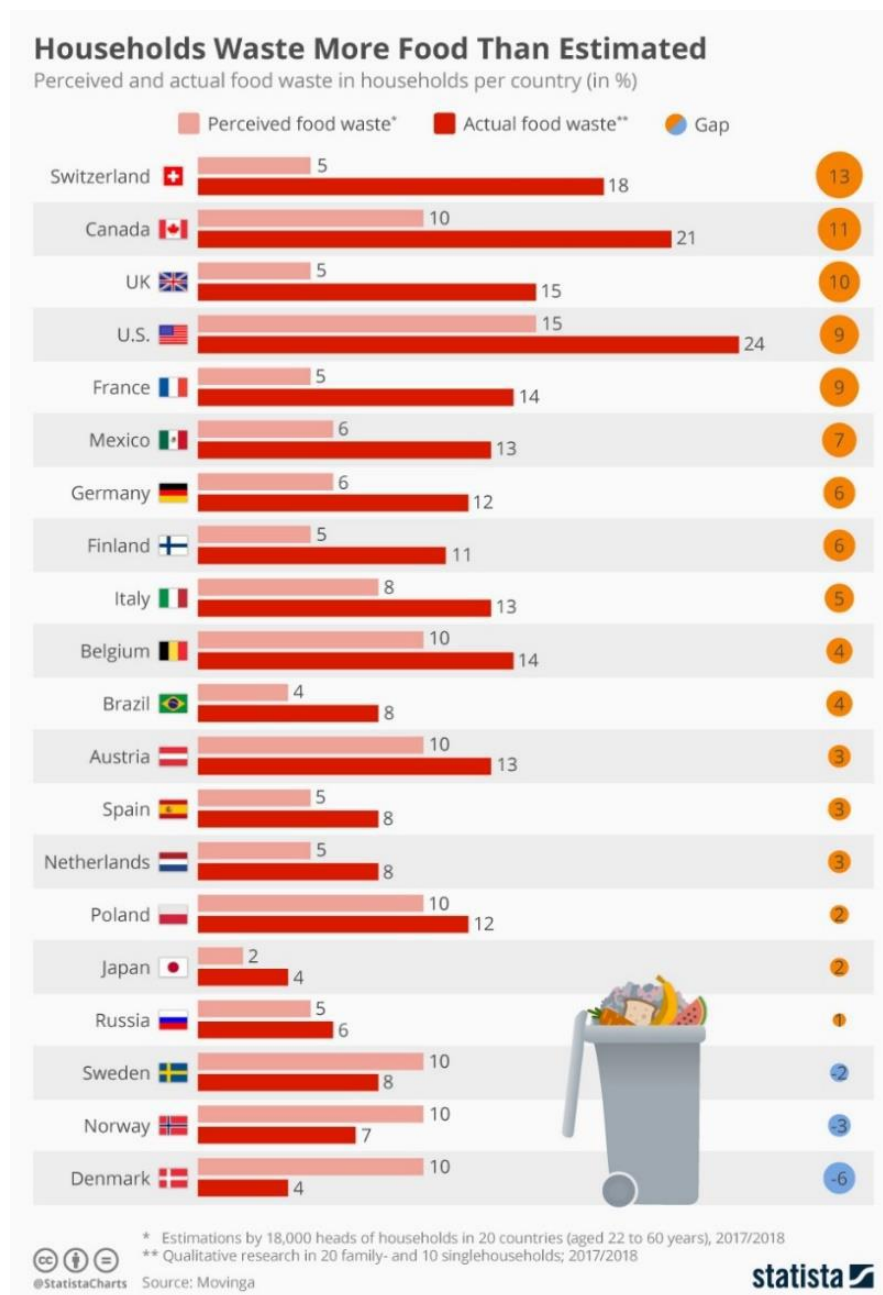
International research reveals that the food waste problem is underestimated by the consumers. Globally, people perceive that the food waste problem is smaller than it actually

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 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].

³ 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].

is. 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



Source: Eurobarometer, EPRS, FAO



Source: europarl.europa.eu. 2020

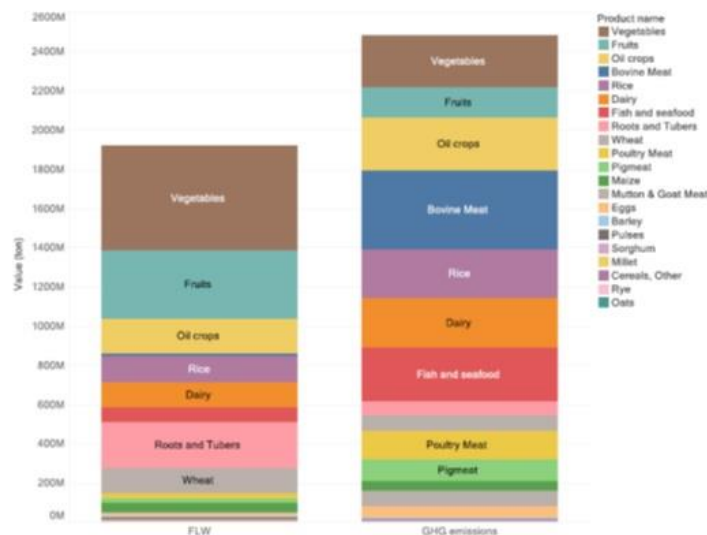
The per capita production of food waste widely differs between members states. Cyprus is among the top food waste producers in the EU. To a certain extent, this is attributed to the touristic nature of the country. Cyprus used to accept (prior to the pandemic), close to 4 million tourists per year, a 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. However, most of the food in the EU is wasted by households with 53% and processing with 19%.

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

Wasting food is not only an ethical and economic issue but it also depletes the environment of limited natural resources. By reducing food losses and waste, we help achieve Sustainable Development Goals

According to a very recent study on hotspots for food waste production⁴, vegetables and fruits contributed the most to food loss and waste, accounting for almost half of the total food loss and waste. Bovine meat was not a hotspot at all with respect to FLW (only for 0.7% of the total FLW), but it was the largest hotspot for the FLW-associated GHG emissions and contributed as much as vegetables and fruits combined (16.3%).



Global hotspots for FLW and associated GHG emissions in 2017.

Source: Guo et al., 2020

In general, primary production and consumer stages yielded slightly higher food loss and waste and associated GHG emissions than the storage and handling and food distribution stages. The processing stage generated much lower FLW and associated GHG emissions compared to other stages. Specific to food items, it shows that bovine meat was responsible for the highest FLW-associated GHG emissions in the consumer stage.

⁴ Guo, Xuezhen & 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



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

Source: Guo et al., 2020

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) to help European businesses and consumers to make the transition to a stronger and more circular economy where resources are used in a more sustainable way. The proposed actions will contribute to "closing the loop" of product lifecycles through greater recycling and re-use and bring 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 lives.

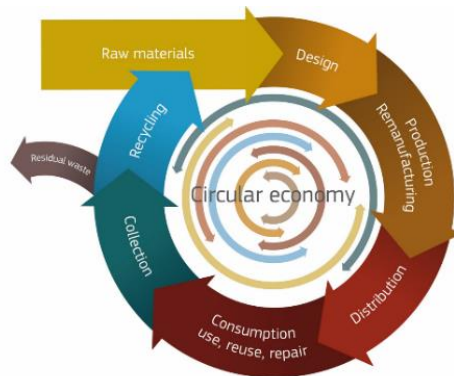
The CEP, aims to drive the EU economy from a linear model:



Linear Economy Package – EU

Source: First circular economy action plan, 2020

To a circular model:



Circular Economy Package – EU

Source: First circular economy action plan, 2020

The European Green Deal

The EU Green Deal, released by the Commission in December 2019, resets the Commission's commitment to tackling climate and environmental-related challenges that is this generation's defining task. 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 destroyed.

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 use.

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'.



Farm to Fork- EU

Source: Farm to Fork Strategy, 2020

From 'Farm to Fork': designing a fair, healthy and environmentally friendly food system

The Farm to Fork Strategy is at the heart of the European Green Deal aiming to make food systems fair, healthy, and environmentally friendly.

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. Overall European Union averages to 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 undernourished.



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.



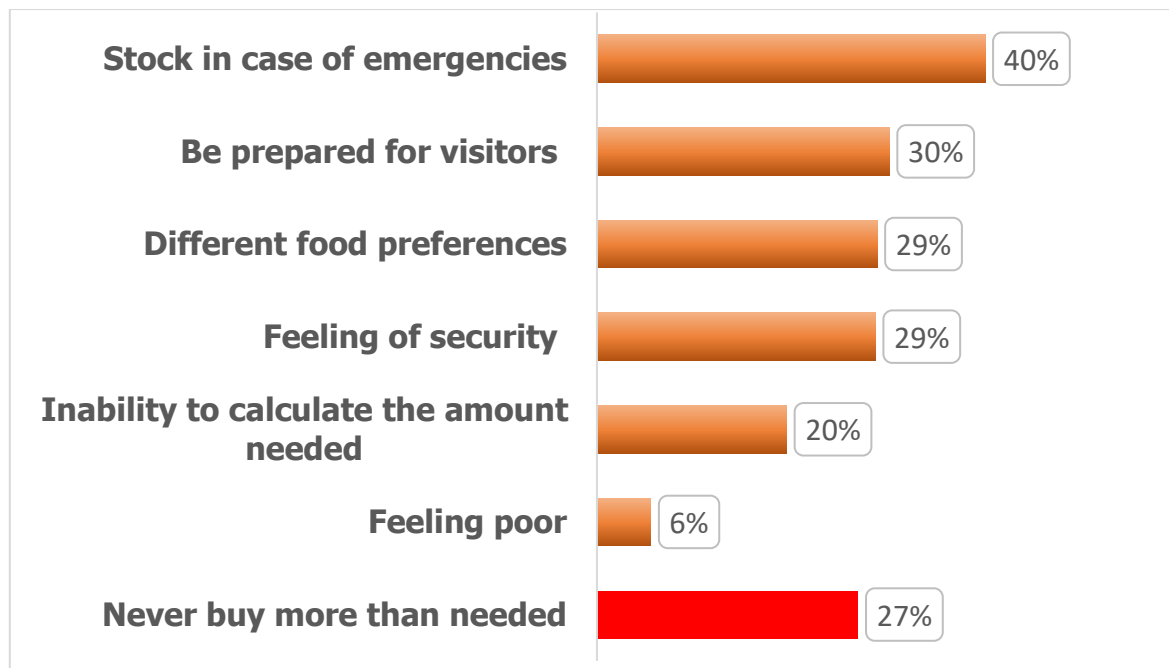
Public Opinion Surveys - Cyprus

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)

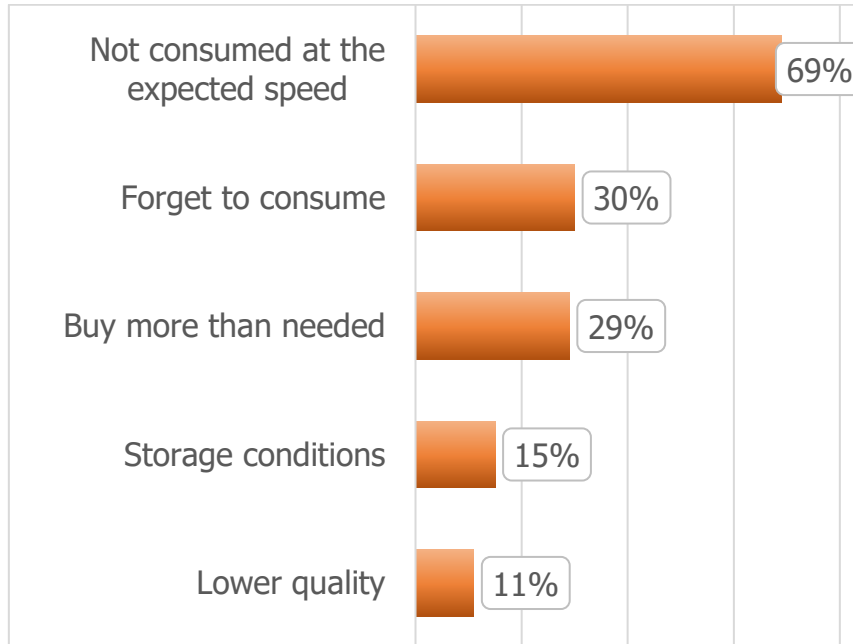
Seven out of ten consumers tend to buy more than the required quantities of food. These habits may root back into concerns of security among the population.



Buying more food than needed

Food waste generation reasons (1st survey)

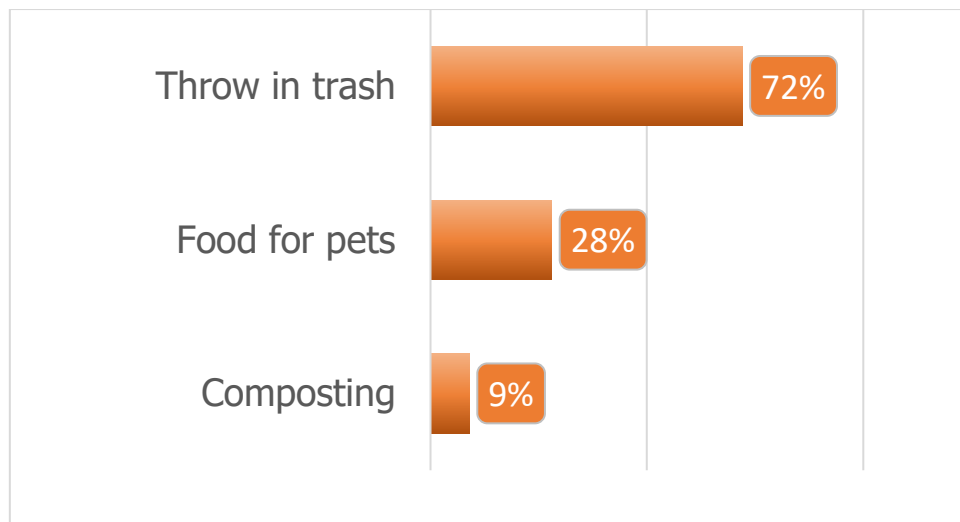
The main reason food is wasted is because it is not consumed at the expected rate, which is reported to a much greater extent by all participants in the research. To a lesser extent, consumers report that they forget to consume food and that they buy more than they need.



Food waste generation reasons

Food waste management (1st survey)

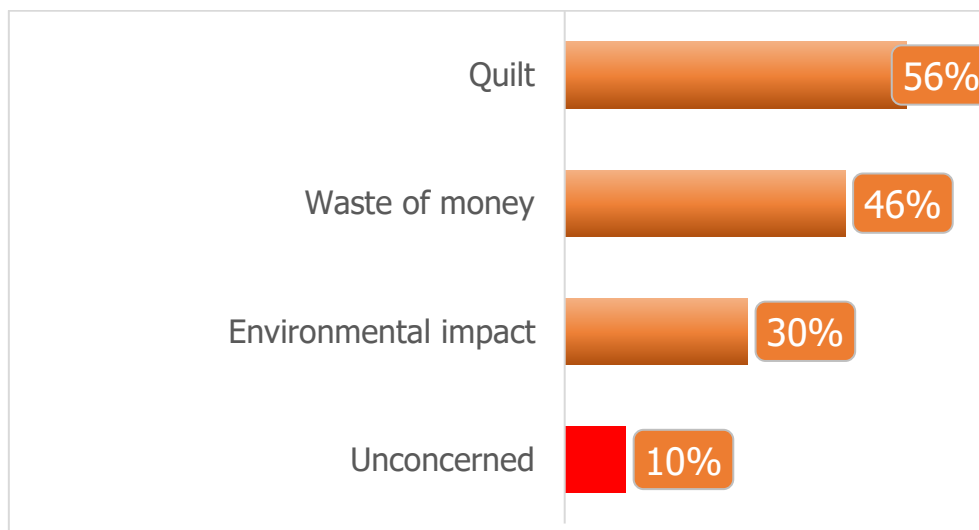
Most consumers throw away the food they consider unsuitable for consumption (72%). Three out of ten give this food to pets, while much fewer report that they compost it.



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.



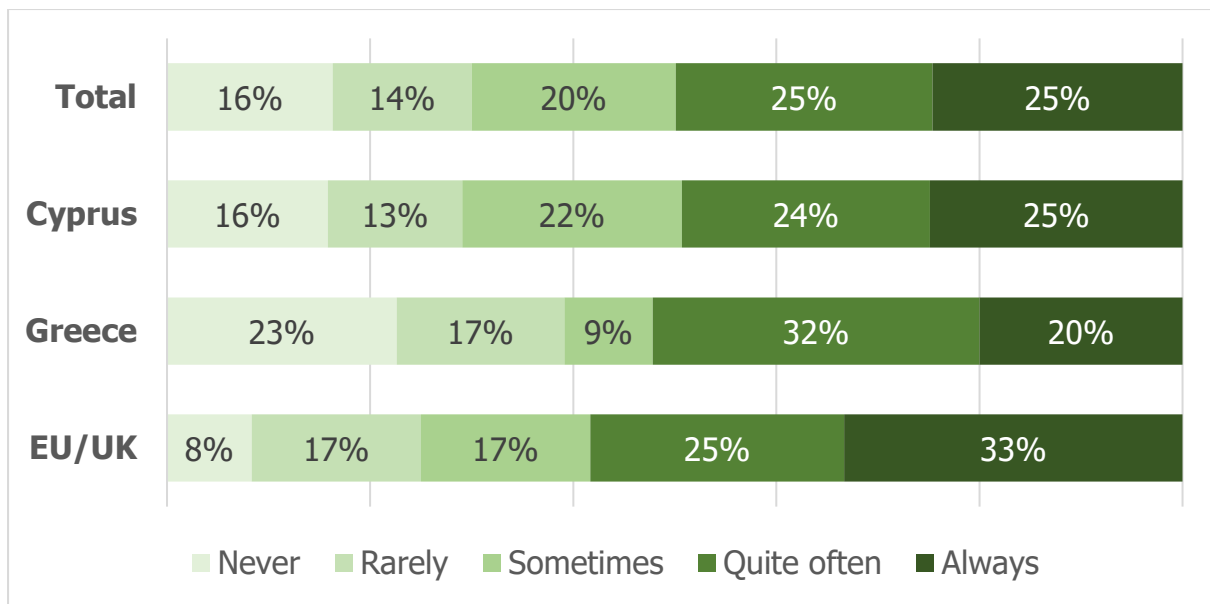
Feelings when wasting Food

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%.



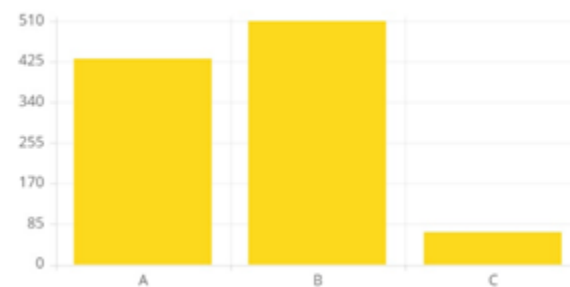
Taking Food Leftover from outings

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

Most people do not realize how much food they throw away every day — from unconsumed leftovers to spoiled produce. By managing food sustainably and reducing waste, we can help businesses and consumers save money, provide a bridge in our communities for those who do not have enough to eat, and conserve resources for future generations.

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 [Greece]

Boroume represents the collective effort of a group of people to reduce food waste and at the same time to increase donated food in Greece. Boroume's goal is to coordinate the procedure for donating goods to those in need. Their team along with saving and offering food managed to create and implement two new programs, the "Alliance for the Reduction of Foodwaste" and "We are family – COVID – 19". More Specifically in 2020 Boroume saved and offered more than 9 million portions of food while also raised awareness about food saving through information presentations, seminars, and social media channels. Through the educational program "Boroume at school" they launched their ambitious initiative, the "Alliance for Reduction of Food Waste" in which public authorities, professional and scientific bodies, food, and catering companies from all stages of the supply chain, Civil Society Organisations, bodies of the academic and research community join forces.

The second program "We are family" is to create families of support consisting of those who wish to help and those facing food insecurity in Greece. This is done through a direct and transparent process which converts all monetary donations into supermarket vouchers strictly for the purchase of food, thus ensuring the beneficiaries dignity with zero operational costs for the donors. In 2020 €1.169.130,60 was converted to supermarket vouchers for the purchase of food for 39.617 beneficiaries.

Rescuedbox [Cyprus]

Rescuedbox mission is to tackle food waste and become part of the solution. Their aim is to do that by rescuing 500 tonnes 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" 133.2 tonnes of foodwaste. 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 mission.

Überinsecta – [Cyprus]

With the rapid population growth, economic development, and urbanization, the rapid increase in per capita income and urbanization is likely to result in structural changes in demand for food and other agricultural products. To meet the demand for these resources, agricultural production is projected to increase by 49% between 2013 and 2050 (FAO, 2017), while, from 2005 to 2050, meat, egg, and dairy production are projected to increase by 76%, 64%, and 62%, respectively.

Similarly, global food fish production in 2030 is projected to be 17.6% higher (30 million metric tons live weight equivalent) than that in 2016 (FAO, 2018). Since about six units of plant protein are required to produce one unit of high-quality animal protein, the projected increase in meat and dairy production will result in substantial increase in demand for protein-

rich animal feeds. A significant amount of organic waste is generated worldwide and is not properly managed, especially in low- and middle-income countries.

Annually, a third of all food produced (about 1.7 billion metric tons) is lost or wasted along the food chain, which has a significant environmental (3.3 billion metric tons of CO₂-equivalent greenhouse gas (GHG) emission per year) and economic (total social costs of \$ 1.2 trillion per year) footprints (FAO, 2014).

Currently, landfilling, and haphazard land disposal dominate the waste disposal methods, especially in low- and middle-income countries, resulting in substantial environmental (ground- and surface-water pollution and GHG emissions) (Bogner et al., 2008; Reddy and Nandini, 2011), public health (breeding ground for disease vectors) (Lohri et al., 2017; Reddy and Nandini, 2011), economic (transportation cost), and social (not-in-my-backyard) issues.

In this context, insect farming on organic wastes provides an avenue for wastes bioremediation with concurrent generation of nutrient-rich feed (i.e., insect bio- mass) and organic fertilizer. Farming insects on different organic wastes such as food waste, has been reported to reduce the organic waste by 25–72% (dry matter basis) and nutrients such as nitrogen and phosphorus by 22–57% and 35–70%, respectively.

Überinsecta is a start-up company that has been established based on a growing idea that becomes reality. They focus on taking advantage of the international problem of food waste and turning it into a resource of feeding insects that through their feeding and cycle life can turn this organic material into several products (from fertilizers to animals feed and for some countries even as a human consumption product, such as protein bars). The overall process is within the context of circular economy and more specifically by converting the wasted value into valuable product.

Food Waste Reduction Alliance – [USA]

The Food Waste Reduction Alliance is a joint industry collaborative focused on reducing food waste. The effort, launched in 2011 by the Grocery Manufacturers Association, the Food Marketing Institute, and the National Restaurant Association, aims to reduce food waste at its source, increase donations to food banks and decrease the amount of food sent to landfills. FWRA brings together the manufacturing, retail, and restaurant industries, as well as expert partners from the anti-hunger and solution provider sectors to tackle one of the biggest challenges in the United States. More than 30 companies have joined the effort and are actively seeking solutions to this challenge.

The Food Waste Reduction Alliance is a good example for bringing together manufacturing, retailing and food service companies as well as experts from the redistribution and food waste sector. More than 30 members are involved. They aim to achieve three main objectives: Reducing the generated food waste, increasing the quality of donated food and prioritize recycling of unavoidable food waste. Studies on food waste amounts and food waste diversion among manufacturers, retailers and restaurants are conducted to analyze the progress and to become aware of new challenges.⁵

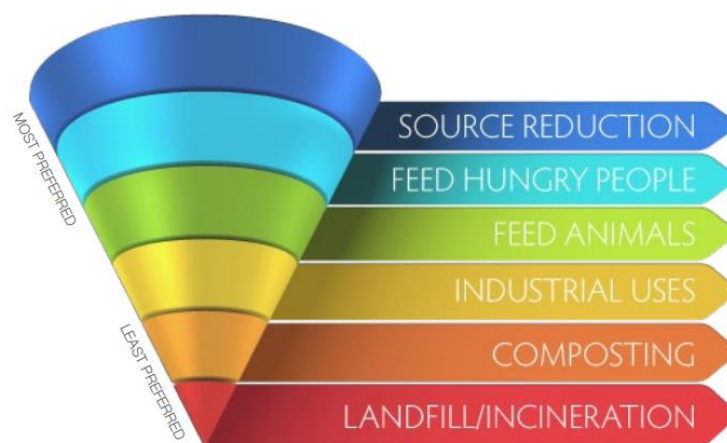
⁵ Definition of best practice activities in food waste prevention and management – Interreg Central Europe STREFOWA, (2016).



Food Waste Reduction Alliance 3 goals

[Source: foodwastealliance.org](http://foodwastealliance.org)

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



Food Recovery Hierarchy

[Source: foodwastealliance.org](http://foodwastealliance.org)

Thinking about the Food Recovery Hierarchy, eliminating waste is a top priority, followed by feeding people, via do nation or other means. The hierarchy also gives us some guidance on how to direct materials not suitable for feeding people to higher material value than dumping in a landfill to decompose.

Goodfood – [United Kingdom]

Issues of packaging, food waste and sustainable practices are complex. At Good Food, they are trying to find realistic solutions to the problem of food waste and packaging generated by their test kitchen and members of the team are taking on green challenges at home.

Around 80 recipes a month are tested, videos are made, and pictures are taken for food and products that come in all sorts of packaging.

To tackle the waste produced by the tests mentioned above, the team eats all of the food that comes out of the test kitchen, so when they talk about waste, they mean peelings, offcuts and – on the rare occasion that a recipe goes horribly wrong and is inedible – a complete dish. Each Friday staff take unused ingredients home and challenge their cookery assistant Liberty to make lunch using as many leftovers as possible.

United Against Waste - [Austria]

The initiative "United Against Waste" (UAW) was founded in Austria in 2014 and has currently 35 members from the food service industry, research institutions, NGOs, ministries in Austria. Its aim is to halve the avoidable food waste in the Austrian food service sector by 2020 which is promoted by a comprehensive program of activities. Until now, the food waste generation of 50 Austrian food service outlets including restaurants, hotels, workplace canteens and healthcare centres were investigated. Based on this data strategies for food waste reduction were developed and implemented. UAW as an industry platform is jointly funded and supported by its partners. The ratio between the amount of avoidable food waste and the food consumed ranged between 3 to 46 % in all companies. Extrapolated over the whole of Austria about 50,000 t of avoidable food waste was generated in hotels, 45,000 t in restaurants, 61,000 t in canteen kitchens and 19,000 in other outlets such as coffeehouses. This corresponds to an average, annual product value of about 320 million Euro for the Austrian food service sector or 8,000 Euro for each food service outlet (basis of calculation 49 companies).⁶

Iss Mich! Bio-Catering (Eat me! Bio-catering) - [Austria]

Since 2012 the waste-cooking-show wastecooking has been raising awareness for the topic of food waste. Now the waste cooking-chef Tobias Judmaier is taking initiative. Founding the food brand Iss Mich! is an important move in stepping up against food waste. The Viennese catering company uses fresh, non-compliant vegetables (misfits) from organic farmers, which cannot be sold on the market. The food is served in refillable jars at events or delivered by bike to the offices in Vienna. (Winner of the Viktualia Award 2014) "eat it, don't waste it" is the slogan of Iss Mich! That's why Iss Mich! (eat me!) prepares vegetarian dishes from perfectly healthy veggies that did not meet retail standards - not due to quality but due to aesthetics. The dishes are served in jars in order to reduce packaging. With every Iss Mich! Glas 300 g of vegetables and 50 g of plastic waste are saved.^{7,8}

Unverschwendet – [Austria]

The young entrepreneur Cornelia Diesenreiter produces jam, chutney, and syrup out of non-used fruits, vegetables and herbs. She gets the ingredients (misfits) from farmers and private gardens in Vienna. Either she directly pick-ups the goods from the farms or she harvests them herself. Cornelia sells her products on her website, on small markets and in small shops. Thanks to the network of more than 34 fruit donors, about 1173 kg of fruits and 949 kg of vegetables could be processed in 2016. Within three weeks almost the entire inventory (2,500 jars) has been sold. Another success story is the cooperation with the Viennese food bank. In December 2015 Cornelia Diesenreiter started to cook with people affected by poverty, such as young people and refugees, within the initiative "Smart jam". This concept will be implemented in another Austrian city in 2017.

Albert composter – [Czech]

Selected Albert stores (Ahold) uses a special composter that transforms otherwise useless scraps into a concentrated soil substrate. The entire composting process takes only 24 hours. This ecological solution can transform unsold and unsatisfactory fruits and vegetables but

⁶ Definition of best practice activities in food waste prevention and management – Interreg Central Europe STREFOWA, (2016).

⁷ iss mich! 2022. iss mich! [online] Available at: <<http://www.issmich.at/>> [Accessed March 2022].

⁸ Definition of best practice activities in food waste prevention and management – Interreg Central Europe STREFOWA, (2016).

also, for example, leaves or foliage of vegetables into natural fertilizer for farmers. This technological innovation aims to reducing the environmental burden of food waste in landfills and also to simplify the handling of food waste.

These composters are currently in place in five large stores. This pilot operation began in Albert two years ago (2014). The special composter works on the same principle as natural composting or domestic composting; however, the composter is bigger (about the size of a freezer), and it is also faster. At the back of the stores, fruits and vegetables that cannot be sold anymore are collected in crates. Leaves or stems are also included. Once the crate is full an authorized employee simply dumps the content into the composter. The special machine speeds up the natural composting process using high temperatures, micro-organisms, and air. The result at the end of the process is nutritious substrate formed within only 24-48 hours. Once humus is produced the fertilizer is then transported via a local composting facility to local farmers. Due to the high concentration of the resulting product, it is mixed into substrate fertilizing mixtures used for local fertilization of agricultural land. The organic component is thus returned into the soil and the cycle is closed contributing to a circular economy. Composting on site simplifies the logistics of the process of discarding food that cannot be sold. The bio-waste weight reduction is up to 90% and allows easy collection and transport of a uniform substrate to local composting.⁹

Sodexo CZ– [Czech]

Sodexo operates over eighty restaurants in the Czech Republic, mostly in companies, and large amounts of food is thrown away each day amounting to about 330 tons of food each year. Therefore, in September 2015 Sodexo CZ joined the initiative of Waste Watch, which promotes methods to better monitor food wastage and has pledged that by 2025 they will reduce waste by 30 percent, which means that each year they will produce ten tons less food waste. In practice, Waste Watch means that Sodexo measures and then analyses four kinds of food waste. First, foods that cannot be consumed because it is expired or otherwise impaired. Second, waste generated during food preparation, such as peelings, vegetable waste, scraps of meat. Third, the portions that are not issued to customers. Fourth, and finally food that customers buy, do not eat, and return it on their trays. These four groups are collected separately in plastic containers for better monitoring not only the quantity but also the composition. Measured values are recorded in daily reports and subsequently put into an overall review. These reports serve as a basis for drawing up action plans to reduce waste. Related to this initiative is the internal plan of Sodexo CZ to reduce its food waste by 2025 by thirty percent. For instance, by refining production planning, enhancing control of deliveries and warehouse management, discussing the range of meals with clients, optimizing the size of portions, and better responding to seasons. 95 percent of all Sodexo restaurants are in companies, thus focus so far is mainly in this sector.¹⁰

Brno municipality – [Czech]

This is a unique project in the city of Brno and the Czech Republic, whereby canteens provide free left-over or unsold lunch menus to the homeless on weekdays. Employees of the Social Services Centre pick up the left-over or unsold lunch menus directly from the canteens and

⁹ Definition of best practice activities in food waste prevention and management – Interreg Central Europe STREFOWA, (2016).

¹⁰ Definition of best practice activities in food waste prevention and management – Interreg Central Europe STREFOWA, (2016).

transport them to the Centre of emergency assistance for those in extreme social situations where the homeless can get a good hot meal which would have otherwise been thrown away. All organization and financing of the project is under the Social Services Centre, which includes the purchase of fuel, workers' wages, the purchase of menu boxes, thermos-bags, and thermos-containers in which the food is transported, and disposable plastic tableware, including other resources necessary for serving food. All this is applied according to the recommendations of the hygiene station in Brno. The project is implemented under the supervision of the Regional Hygiene Station in Brno.

- In 2015 there were 7 canteens involved in the project, on average 127 portions daily were transported and distributed to the homeless. In total 31,828 portions were issued in 2015.
- In 2014 there were 7 canteens involved in the project, on average 129 portions daily were transported and distributed to the homeless. In total 32,620 portions were issued in 2014.
- In 2013 there were 7 canteens involved in the project, on average 164 portions daily were transported and distributed to the homeless. In total 41,321 portions were issued in 2013.
- In 2012 there were 7 canteens involved in the project, on average 84 portions daily were transported and distributed to the homeless. In total 21,154 portions were issued in 2012.
- In 2011 there were 12 canteens involved in the project, on average 54 portions daily were transported and distributed to the homeless.
- In 2010 there were 13 canteens involved in the project, on average 60 portions daily were transported and distributed to the homeless.¹¹

Univer Product – [Hungary]

The Project aims at waste reduction from food industry. Beside this also a reduction of water consumption, reduction in the quantity of packaging materials as well as the reduction of CO₂ emission is foreseen. This company, based in Kecskemét, was implementing a project to modernise its technology and support tomato processing of a high quality and quantity. As part of the project, Univer submitted a project proposal to subprogram 1 of the Green Industry Innovation programme of Norway Grants. Generated sludge will be recycled on farmland instead of ending up in junkyard. This will be combined with a technology which reduces the quantity and moisture content of tomato waste. The burning of tomato waste will also reduce the plant's emission of CO₂.

As a part of the project, the quantity of the packaging materials which are used will be cut as well. Water consumption, wastewater output and waste output will be drastically reduced along entire technology chain which will also enhance energy efficiency. The new utilization of the sludge is the composting at the land. This was the Univer's own project, which was supported by Norway grant. The innovative technology has effect on the producers due to

¹¹ Definition of best practice activities in food waste prevention and management – Interreg Central Europe STREFOWA, (2016).

increased volume of production. The company can produce more tomatoes (triple amount than before) with less waste by this new technology.¹²

Banco AlimentareOnlus (Food Bank) – [Italy]

Promoting policies for fighting food waste and supporting poverty and social exclusion with the support of European and national institutions is the specific mission of Banco Alimentare. Born in 1989, Banco Alimentare collects in Italy unused, intact, and not expired food, which should have been generally doomed to destruction because considered as not marketable. On the contrary, if saved these products gain a new value and represent a new richness for those who have less.

This food waste network is every day engaged in the whole country through 21 Italian food bank organization coordinated by Banco Alimentareonlus. In 2015, Banco Alimentare has achieved the saving of 78.448 tons of food excess, the collection of 9.711 tons food products (8.990 tons during the Food Waste Day), the donation of 1.125 cooked dishes from food services, school, and private business canteens, 343 tons of bread and fruits are daily redistributed for free to 8.103 charity organizations which help 1.558.250 people in Italy. 1.843 volunteers work daily for Banco Alimentare. The main sponsors of Banco Alimentare are: Poste Italiane, Unipol Sai Assicurazioni, Intesa San Paolo – Banca Prossima, Eni, the patronage of the Presidency of the Italian Republic, and the in collaboration with Esercito (Army), CDO Opere Sociali, Società San Vincenzo de Paoli, Associazione Nazionale Alpini.

Since 1996, the National Day for Food Collection for the poor on the last Saturday of November. This initiative has been conceived as a national awareness campaign for consumers who are invited to buy some food (such as pasta, rice) on the Saturday Shopping. The biggest Italian chains participate in the event, encouraging the support of the citizens to give part of their purchase. In 2015 Banco Alimentare in one day has collected 8.990 tons of food for poor people. For this initiative concerts exhibitions, meetings and debates are organized with the purpose of collecting funds for its organization.¹³

Last minute sotto Casa LMSC – [Italy]

It is a Win Win Win project in order to combat food waste in which the small local food shops, the customers, and the planet win. It consists in a new formula of "live-proximity marketing" that allows stores with food in excess and / or expiring, inform through a mailing list or through the app thousands of people. Last Minute sotto casa supports the shopkeepers, who transforms the losses generated by the food not sold in new revenues previously unthinkable and - most importantly - attract NEW customers with food for sale. Also, the customer wins, because the consumer purchases at highly discounted prices in a fresh product and at the end the Planet wins. About 700 shops take part (the network of LMSC) with 50,000 of app users. Last Minute sotto casa was born in Turin, in the Santa Rita district, in April 2014 by the idea of Francesco Ardito, who is pursuing the project with Massimo Ivoli. The idea comes from a daily dialogue with shopkeepers, especially the bakers in the area, asking them what end the food will not selling at the end of the day. Every time the answer was 'throw it'. From this the

¹² Definition of best practice activities in food waste prevention and management – Interreg Central Europe STREFOWA, (2016).

¹³ Definition of best practice activities in food waste prevention and management – Interreg Central Europe STREFOWA, (2016).

idea: If the retailer could warn people of the district, before closing time, that there is advancing good quality food and they can have it with a low price, it could be a great idea.

The idea was incubated inside the I3P, the incubator of innovative companies of the Politecnico of Torino in 2014. One of the most important benefits is that LMSC proposes an intelligent, non-alienating, technology use. If till now the technologies are used to purchase products and services that arrive inside our home, in this case they are used to do the opposite: to get in touch with the shopkeeper in the neighbourhood. So once you get the offer available online and if you are interested, you can go into the store to buy the food. This allows you to give importance to the small neighbourhood shops and encourage socialization. It consists in matching the market supply to the market demand through an app. It consists in a platform where sellers make food not sold or exceeded to potential buyers (citizens) at lower prices. It is a community (the startup was born in 2014 at the innovative incubator of the Polytechnic of Turin).

Last Minute Market – [Italy]

Last Minute Market is a project where retailers, shops and producers who have unsold food which would otherwise be discarded are linked with people and charities who need food. Originating in Bologna, it is active in more than 40 Italian towns, with 2 new projects under development in Argentina and Brazil. LMM offers services to enterprises and institutions in order to prevent and reduce waste production at its origin. It also develops innovative services for the recovery and reuse of unsold goods. Since the introduction of the Italian anti-waste law in 2008, non-food items can also be recovered. LMM helps companies to manage surpluses in innovative ways, which can reduce waste disposal costs and improve the company's links with the local community public institutions while the community benefits from the reduction in the flow of waste to landfill and improve food availability for the sectors of society that need it.

Last Minute Market Ltd is a spin-off from the University of Bologna and it has been running since 1998. In recent years, despite a thriving economy (until recently) and reports of welfare reform success, a growing number of people in developed countries have sought emergency food assistance because households did not have access to enough food to meet their basic needs. For a variety of reasons, the same developed economies produce a growing quantity of food surplus. Such surplus is present everywhere in the food chain, from agricultural production to the retail system and often is still edible. This can yield environmental, climate and societal benefits. The supply of unsold edible foods is provided by processing industries, food shops, retail stores and the like.

In 2008 from supermarkets alone, nearly 170 tonnes of good edible food have been recuperated through LMM, with a value of €646,000. Quantitative and qualitative data analysis has shown that LMM brings about environmental, economic, and social benefits. Professor Segrè reports that, if LMM Food were to be adopted nationwide in Italy by supermarkets, small shops and cash and carry shops, €928,157,600 would be the monetary value of recuperated products. Furthermore, these products could provide 3 meals a day to 636,000 people – in total 580,402,025 meals a year.¹⁴

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

It is also important to underline that – by not sending these products to the landfill – 291,393 tonnes of CO₂ emissions could be spared. This has been calculated through a methodology developed by the Department of Agricultural Economics and Engineering of the Faculty of Agriculture (Bologna) consisting of a time correlation tracer method based on a Fourier Transform Infrared Analyzer absorption spectroscopy which measures gas levels. In the case of pharmacies, medicines could be recuperated for a value of €597,504,600. LMM is a win-win project, with benefits for the different stakeholders as well as for the environment.

Food Banks in Cracow - [Poland]

The aim of the project was to increase awareness and knowledge among children on environmental, social, and economic impact of food waste. This was achieved through the implementation of 26 two-hour workshops on the effects of food waste, through information mobile on two refuse trucks which contains a poster with the slogan "Do not waste food. Together counteracts wasting food" and through the implementation of the celebration of World Food Day and march Strike Food, and through the implementation of a competition for a social event and a publication" Respect the food and the environment. "Educational activities among primary school children of the city of Krakow - realized 26 two-hour workshops in 10 primary schools in grades 4-6. A poster on the effects of organic food waste for schools was prepared. - Respect the food and the environment. The publication contains information on food waste and its effects, how to prevent this effect on the scale of the immediate environment and how to encourage others to such behaviour, which change attitudes can change for the environment.¹⁵

FEED Them UP – [Poland]

Aim of the project is to mediate in the transfer of surplus food catering to community organizations involved in feeding their charges. Key focus of the initiative is to support food people in need, preventing food waste, increasing public awareness of food waste. Project FEED Them UP was created in response to the huge problem of the waste of food in Poland and at the same time a huge demand for food supplies by charities. FEED Them Up encourages Warsaw dining options to provide surplus food organizations, which usually involved in preparing meals for the needy. The activities are conducted in Warsaw. The project consists of 5 students. This is a unique initiative in Poland and worldwide, involving the transfer is still useful to the consumption of food from catering services to benefit the public every day dealing with the preparation of meals for those in need. This type of activity was not carried out earlier in any city in Poland.

Food for people in need can pass all the places to eat - restaurants, cafes, bars, milk bars, bakeries, pastry shops, as well as catering companies and hotels and also small shops. Feed them up selects an appropriate organizations, which will accept food from a restaurant based on the amount, frequency and type of (unprocessed food / processed / prepared meals) transferred donations of food. Collection and transport of food is usually provided by the organizations.

From the beginning (March 2016) received dozens of donations of food, in which transferred several hundred kilos of food. Feed them up also aims to raise awareness of the opportunities

¹⁵ Definition of best practice activities in food waste prevention and management – Interreg Central Europe STREFOWA, (2016).

to prevent wastage of food (after contact with the developers of the project could not be determined detailed information about the number of acquired and transferred food).¹⁶

Food Outlet – [Poland]

Food trade by ending expiration date provides the possibility of buying good at half prices. A store or warehouse can put goods on the platform, and consumers find eg. of factory canteens, hospital, school, milk bars, catering companies and restaurants. Food Outlet assists in the settlement of VAT in respect of transfer of products to the organization having the status of OPP. Automated exchange of food to sale through the platform of products of different sizes in determining their category, size, ingredients, expiry date and others. Food manufacturers can post through the application of specific products, which will be automatically categorized by the system, and then exposed to the stock market at a fixed price by the exhibitor. Any customer wishing to purchase the product will be able to pay for the selected amount of goods.¹⁷

¹⁶ Definition of best practice activities in food waste prevention and management – Interreg Central Europe STREFOWA, (2016).

¹⁷ Definition of best practice activities in food waste prevention and management – Interreg Central Europe STREFOWA, (2016).