

DEFINITION OF BEST PRACTICE ACTIVITIES IN FOOD WASTE PREVENTION AND MANAGEMENT

Deliverable D.T1.2.1

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Eidtors:

Gudrun Obersteiner

Sandra Schwödt

Contributing Authors:

Iris Gruber

Marlies Hrad

Zsolt Istvan

Maria Kowaleska

Christine Maritz

Marcella Poncini

Renata Sandor







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1. Introduction

This report is the deliverable for activity A.T1.2 “Best Practice”. It aims to get knowledge on functioning best practice models applicable in the selected urban areas. In addition, literature research was conducted on an international level to find international best practice methodologies for food waste prevention and management along the supply chain. It should provide a basis for the implementation of pilot actions.

In order to identify best practice activities or initiatives for food waste prevention and management, normally several selection criteria are used. Some general criteria such as “targeted”, “effective”, “measurable”, “innovative” and “replicable” are for example defined within the EU project FUSIONS (Vittuari et al., 2015):

- **targeted:** practices that have a strong waste prevention focus, clearly distinct from other waste management strategies or broad environmental goals;
- **effective:** practices based on guidelines, protocols, standards, reports, or preferred practice patterns that have been proven to lead to effective food waste prevention/reduction practices;
- **measurable:** practices that have an evaluation plan in place to measure program outcomes, even if they do not yet have evaluation data available to demonstrate the effectiveness of positive outcomes;
- **innovative:** practices that use original or resourceful techniques for waste prevention;
- **replicable:** practices that can be easily reproduced and are similarly relevant in regions across Europe;

In general, each measure to prevent food waste has the potential to become best practice. Within the STREFOWA project the selection of best practice project was mainly based on the replicability within the planned pilot activities in the STREFOWA functional areas. But also the innovation of actions was one selection criteria. Therefore, well known actions like foodbanks are not mentioned as they are already practiced in all participating countries.

2. Best Practice Examples

In the following section best practice examples from each country will be presented. Beside the above mentioned criteria it was focussed on originality of the examples to avoid showing similar examples for each country. Main interest was also laid on the possible replicability of measures in other participating countries as well as assignability to STREFOWA pilot actions. All examples are on behalf of all similar examples and don't have an unique position.



2.1. Austria

2.1.1. United Against Waste



Type of initiative	Operational measure/Association
Actor responsible for the initiative	Tatwort nachhaltige Projekte GmbH
Main target groups	Food service sector
Country	Austria
Geographic level of implementation	National
Year of implementation	Since 2014
Website	https://united-against-waste.at/

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 millions Euro for the Austrian food service sector or 8,000 Euro for each food service outlet (basis of calculation 49 companies) (BMLFUW, 2016)

Source: <https://united-against-waste.at/>



2.1.2. Iss mich! Bio-Catering / Eat me! Organic catering



Type of initiative	Association/Company
Actor responsible for the initiative	Iss Mich! Bio-Catering (Eat me! Bio-catering)
Main target groups	Multiple target groups, focus group: whole sail/retailer/market
Country	Austria
Geographic level of implementation	Vienna
Year of implementation	Since 1999
Website	http://www.issmich.at

Since 2012 the waste-cooking-show wastecooking has been raising awareness for the topic of food waste. Now the wastecooking-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 (www.issmich.at).



2.1.3. Unverschwendet / Unwasted



Type of initiative	Association/Company
Actor responsible for the initiative	Unverschwendet
Main target groups	Multiple target groups, focus group: privat consumers, garden owners
Country	Austria
Geographic level of implementation	Vienna
Year of implementation	Since 2015
Website	www.unverschwendet.at

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) have 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.



2.1.4. Junior Company

Within the international network “Junior Achievement - Young Enterprise Europe” students aged between 15 and 19 get the chance to start up real companies for the duration of a school year. They offer self-developed products and services on the real market. Students independently develop their own business idea and go through all phases of a real economic project (JA-Austria, 2016).

Best Practice Example: Junior Company "Pannonia Paradise"



Type of material	Junior Company
Actor responsible for the initiative	Pannoneum Neusiedl am See
Age Group	15-19 years
Country	----
Geographic level of implementation	Local
Year of implementation	2014
Website	http://www.vgburgenland.at/projekte_junior.html

Description of the Best Practice Example:

Students of the Secondary School for Economic Professions (Pannoneum Neusiedl am See) established the Junior Company Pannonia Paradise within the framework. The students produced tomato sauces and chutneys out of non-used vegetables (misfits) and herbs. The ingredients (e.g. tomatoes, red onions, herbs) were provided by local farmers from Neusiedl am See. The required jars were collected by friends. Steaming devices were used to conserve tomato sauces without the need of any preservatives. In addition, recipes were collected and summarised in a small cookbook. Through their hard work they were able to save up to 400 kg of tomatoes from going to waste. Besides that they also supported a children's village with a part of their products (VWG Burgenland, 2016).



2.1.5. Sozialmarkt /Social Market



Type of material	Food redistribution activities
Actor responsible for the initiative	Sozialmarkt Linz (as example for others)
Main target groups	Retailer, consumer
Country	Austria
Geographic level of implementation	local
Year of implementation	1999
Website	http://www.sozialmarkt.at/

Products from wholesale/retail, industry, catering, agriculture etc. that are near or past their "expiration" date are sold at symbolic prices in social markets (e.g. SOMA-Market). The products might have lightweight packaging damage but are still suitable for consumption. Meanwhile, many "SOMA-markets" have been established, as well as other social markets with different names (e.g. Barbara Laden, Martinladen, Vinzmarkt, solali, Paulusladen, SOMI, Laube, Caritas leo, LEBI-Laden) and mobile version in more remote regions (e.g. Tischlein deck Dich, Rollende-Herzen-Bus).

At the moment 34 social markets are existing throughout Austria that belong to the umbrella organisation SOMA Austria and partners. All those social markets are charitable organisations or non-profit companies with clear regulations on prices, food hygiene and access authorisations. All goods are donated for free from retail and industry. No additional purchase is allowed within the SOMA organisations. IN total about 60,000 needy customers can be reached by this initiatives.

In 2014, food retailers have donated about 6,600 tons of food to social markets such as "SOMA Österreich und Partner", "Le+O - Lebensmittel und Orientierung der Caritas Wien" or "die Wiener Tafel". The share of food retailers cooperating with social markets is as follows: Merkur 100 %, Spar 100 %, Unimarkt 100 %, Hofer 91 %, Billa 80 %, Penny 50 %. In 2013, a total of 11,123 t (+/- 238 t) of food were donated to social institutions in Austria. About 10.482 t (94.2 %) (+/- 227 t) were used as food. (ECR-AG, 2016)



2.2. Czech Republic

2.2.1. Albert composter



Type of initiative	Operational measure
Actor responsible for the initiative	Albert (Ahold), large enterprise
Main target groups	Retailer, Waste management
Country	Czech Republic
Geographic level of implementation	National
Year of implementation	Since 2014
Website:	http://www.albert.cz/pro-novinare/tiskove-zpravy/kompostery-v-prodejnach-albert-zpracovavaji-neprodejnou-zeleninu-a-ovoce-na-hnojivo-pro-farmare

Selected Albert stores (Ahold) uses a special composter that transforms otherwise useless scraps into a concentrated soil substrate. The entire process takes just 24 hours. This ecological solution can transform unsold and unsatisfactory fruits and vegetables but also, for example, leaves or foliage of vegetables into natural fertilizer for farmers. This technological innovation is aimed to reduce the environmental burden of food waste in landfills and also to simplify the handling of food waste. There are currently composters in five large stores.

This pilot operation of using a special composter began in Albert two years ago (2014).

The special composter used 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 more 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



facilities. This reduces both the number and the length of transport and thus significantly reduces the carbon footprint.

Source: <http://www.albert.cz/pro-novinare/tiskove-zpravy/kompostery-v-prodejnach-albert-zpracovavaji-neprodejnou-zeleninu-a-ovoce-na-hnojivo-pro-farmare>

2.2.2. Waste Watch



Type of initiative	Awareness campaign (operational measure)
Actor responsible for the initiative	SODEXO CZ, large enterprise
Main target groups	Consumers, restaurants, canteens
Country	Czech Republic
Geographic level of implementation	National
Year of implementation	2015
Website	http://cz.sodexo.com/home/pro-media/novinky-a-tiskove-zpravy/newsListArea/novinky-a-tiskove-zpravy/reportaz-sodexo-se-pripojilo-k-.html More info in German: https://www.zugutfuerdietonne.de/neuigkeiten/beispielhaft/artikel/mit-waste-watch-zu-weniger-lebensmittelverschwendung/

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.



2.2.3. Using unused food for people without homes

Type of initiative	Food redistribution activities
Actor responsible for the initiative	Brno municipality, local authority
Main target groups	Consumers, public canteens
Country	Czech Republic
Geographic level of implementation	Local
Year of implementation	Since 2010
Website	http://www.css.brno.cz/index.php?nav01=7925

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 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.



2.3. Hungary

2.3.1. Research and development, technology modernisation, capacity doubling, food industry waste reduction and energy efficiency enhancement



Type of initiative	Operational measures
Actor responsible for the initiative	Univer Product Ltd.
Main target groups	Primary production, processing, wholesale/retail/market
Country	Hungary
Geographic level of implementation	National
Year of implementation	2013
Website	http://www.univer.hu/en/company.html

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



2.3.2. The food is value - FORUM for the reduction of food wastage and loss



Type of initiative	Awareness Campaign / Research Activity
Actor responsible for the initiative	Ministry of Agriculture and Hungarian Food Bank Association
Main target groups	business association, non-profit organisation, government agencies, participants of the production chain, industrial/professional association, organizations of the research, development and education sectors
Country	Hungary
Geographic level of implementation	National
Year of implementation	2014

Main aim of the best practice example is a significant reduction of the food waste. By the planned campaign 8% reduction of food waste shall be reached within 1-2 years, Together with the campaign a survey on the amounts of food waste in Hungary shall be conducted. With the important message of the FORUM „the value of food“ Awareness-raising in a wide range shall be reached.

Key focus of the initiative is the general awareness for the importance of the issue, timelines and awareness raising as well as strengthening the knowledge management and information flow between the stakeholders. The identification of problems and possible solutions related to food waste is another goal of the initiative.

54 different organizations like Research Institute of Agricultural Economics (AKI), National Association of Packaging and Materials Handling, National Association of Food Industries, Danone, Responsible "Gasztrahős", Bonduelle Central Europe participate in the initiative what makes it that unique.

In cooperation with NFCSO is planned campaign for the 8% reduction of food waste within 1-2 years. This presents 50 million Euros for the households.



2.4. Italy

2.4.1. National Day of Food Collection / Banco Alimentare



Type of initiative	Food Redistribution Activity
Actor responsible for the initiative	Banco AlimentareOnlus (Food Bank)
Main target groups	Primary Production, Processing, Wholesale/Retail/Market, Food service sector.
Country	ITALY
Geographic level of implementation	Italy/Lombardia Region/Province of Milano
Year of implementation	1989
Website	http://www.bancoalimentare.it/

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.



2.4.2. Last minute sotto Casa LMSC



Type of initiative	Food redistribution activities
Actor responsible for the initiative	Francesco Ardito (CO-Founder)
Main target groups	Food shops, not supermarkets
Country	Italy
Geographic level of implementation	National
Year of implementation	2014
Website	www.lastminutesottocasa.it

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 thousand 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 will do the food not sold at the end of the day. Every time the answer was 'throw it'. From this the 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 start up was born in 2014 at the innovative incubator of the Polytechnic of Turin).



2.4.3. Last minute Market



Type of initiative	Food redistribution activities
Actor responsible for the initiative	Antonio Segrè
Main target groups	Wholesale/retail/market
Country	Italy
Geographic level of implementation	National
Year of implementation	1998
Website	www.lastminutemarket.it

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 and the community benefit from the reduction in the flow of waste to landfill and improve food availability for the sectors of society that need it
- the third sector reduce operating costs and release resources for other projects

LMM has 6 different and interrelated areas of activities:

- Food- unsold food which is still edible
- Harvest- vegetables not harvested which would be rejected by retailers due to cosmetic reasons or weather damage
- Seeds- seeds that do not conform with market standards
- Catering- products not served by public and private catering
- Books- unsold books that would otherwise be destroyed



- Pharmacy- unsold pharmaceuticals which can be used to meet the health needs of socially disadvantaged people

Project history

Last Minute Market Ltd. (LMM) is a spin-off from the University of Bologna and it evolved from a research project initiated by Professor Andrea Segrè - now Dean of the Faculty of Agriculture. The idea for setting up such a project resulted from analyses of the problem of food availability (food security) and its distribution. It has been running since 1998.

Project purpose

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.

LMM is a project designed to address waste in its many aspects and at the same time to help people in need. 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. For these organisations, the surplus foods and other products represent a cost, as they need to be transported and disposed of in landfill. Demand for these products comes from a number of charity associations or non profit organizations.

Linking surplus (supply) and deficit (demand) could counterbalance this “imbalanced” food market and this is exactly what LMM does.

The challenges

The main challenges for LMM were at the beginning of the project, as there was a general lack of trust in the likely success and effectiveness of the project. The widespread opinion was that if no similar project had been established before, it was probably for good reasons, such as the market structure and supermarket policies.

Another challenge LMM faced was the need to prove to the Local Health Authority that the food recovered was still good, healthy and edible, intact in all its nutritious components and therefore good to be consumed without health-related risks. Currently, the Local Health Authority is one of the main LMM supporters.

Outcomes of the Project

In 2008 from supermarkets alone, nearly 170 tonnes of good edible food has 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.



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.

Plans for the future of the project

In the future, LMM would like to promote a comprehensive strategy, aiming at further developing its 6 different and interrelated areas of activities (food, harvest, seeds, catering, book, pharmacy) and covering the whole of Italy.

LMM will also continue to work in order to promote the passing of anti-waste laws in Italy and in establishing fruitful collaborations on a national and international scale with research institutions and organizations working on waste management and reduction.

In Argentina LMM has recently launched a project on social corporate responsibility and in Brazil LMM it is about to start a pilot LMM project in the San Paulo area.

Collaboration and partnerships

The project works in collaboration with large-scale Retail Facilities (Carrefour, Coopadriatica, Despar, E.Leclerc-Conad among others), Public Institutions and Municipalities, Local Health Offices, Universities (University of Sao Paulo and, University of Buenos Aires), Markets, Foundations, Pharmacies, University canteens and hospitals in Verona.

LMM is interested in establishing collaborations with research institutions and organizations dealing with food waste and eventually in starting LMM projects in other European countries.

The big questions

Climate change is currently the most burning issue the whole world has to face. Food production and food waste in particular are closely connected with pollution and climate change.

Food waste makes a major contribution to methane gas production. Food waste could be fed to animals or it can be biodegraded by composting or anaerobic digestion and reused to enrich soil. Dumping food waste into landfill causes environmental damage. It causes odour as it decomposes, attracts flies and vermin, and has the potential to add Biological Oxygen Demand (BOD) to the water that leaches from the landfill site.



2.4.4. The Italian Law for the Food Waste

At National Level we can find the Regulation about food and pharmaceutical products donation and distribution for social helps and to limit waste.

- It has been issued by the Italian Parliament on the 2nd of August 2016.
- It is the national framework for the food waste.
- It is composed by 18 articles.

Before the National Law there were:

- The previous Law (called “Law of the Good Samaritan) put the charities in the situation to be responsible of the correct storage of the donated food and they were responsible of the expiration date (not the donor but the charities collecting food).
- In the framework of the National Plan to avoid food waste (PINPAS adopted with D.M. 185 of 18/07/2014) and EXPO 2015 there is an initiative concerning the food waste prevention. The PINPAS foresees ten priorities at the national level.

Objectives of the National Law:

- to reduce the waste production along the whole chain (production, transformation, distribution) for food and pharmaceutical products;
- to promote the recycling and donation of food leftover (and pharmaceutical products) for the purpose of social solidarity and human use;
- To limit negative impacts on the environment and on the natural resources with specific actions intended to reduce the waste production and promote the re-use and recycling in order to expand the life cycle of any products;
- to reach general objectives established by the National Programme for the Waste Prevention and the reduction of the biowaste going to landfills;
- Promote research and information activities for consumers and young generation.

With this Law from now it will be more flexible and easier to do donation to charities and food banks. The Law is not coercive and does not use penalties, but incentives.

The Law defines some terms: food operators (private and public along the production, packaging, transformation and distribution; donators (public and private), food leftover, food waste (wasted food for commercial reasons/use), donations for free, expiration date, best before *preferably* .

The operators of the food sector can donate for free food leftover to who is in charge of the collection of these goods. It is possible to collect leftover agricultural products in the field directly.

The Law introduces two different expressions for the expiration date:

- Referring to the time limit as a minimum limit for food products, over it food can be donated (if the products are in good state and the packaging is incorrupt)
- Best before is referring to specific type of food very perishable (over it is not possible to donate the product)

2.5. Poland

2.5.1. The project How not to waste food and protect the environment

Type of initiative	Social action, workshops
Actor responsible for the initiative	Food Banks in Cracow
Main target groups	The direct target group were children in primary classes 4-6 and their caregivers. Intermediate groups: residents of Cracow (e.g. participants and observers of the celebration of World Food Day - Strike Food which aims to draw attention to the problem of food waste)
Country	Poland
Geographic level of implementation	Local, in the City of Cracow
Year of implementation	03.06. - 30.11.2013r.

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.



Figure 1: School competition for a social event - Respect the food and the environment



An Education and information campaign sensitized the residents of Krakow on the environmental impact of food waste. The action involves placing the mobile information of food waste on waste collection vehicles. The streets of Krakow for 3 months drove the car collecting waste with the slogan "Do not waste food. Together counteracts wasting food! ".



Figure 2: *Education and information campaign on waste collection vehicles*

Action - Strike Food

To participate in the strike Foods invited schools and non-governmental organizations. The march participants, artistic performance and distribution of information leaflets were organized for the celebration of World Food Day on October 16th.



Figure 3: *Strike food*



550 people participated in workshops conducted in 10 primary schools in Cracow.

Workshops, information material, education activities and participation in the competition for a social event and the action Strike food increased knowledge level of knowledge and awareness of the ecological impact of food waste in more than 800 people.

About 5,000 people got the message through mobile information on two vehicles collecting waste through the implementation of information campaigns (in cooperation with online media, newspapers, radios and television as well as information on the Food Bank and fanepage on Facebook.

About 170 people attended the celebration of World Food Day - Food march strike.

More than 700 people took part in various social events within the contest framework "Respect the food and the environment."



2.5.2. FEED Them UP



Type of initiative	Food redistribution activities
Actor responsible for the initiative	Feed Them Up
Main target groups	people in need
Country	Poland
Geographic level of implementation	Local, in the City of Warsaw
Year of implementation	2016

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.



The project partners are:

- The mayor, along with the Office of the Capital City District Wola Warsaw
- Volunteer Centre
- Food Banks
- BW Law Firm
- Social Cooperative Wola
- AlfaTronik

Results: 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 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).



2.5.3. Food Outlet



KOSZYK WSPÓLNYCH KORZYŚCI

Type of initiative	online marketplace of food
Actor responsible for the initiative	Food Outlet
Main target groups	food manufacturers, logistics companies, food wholesalers, restaurants, catering companies, school canteens and hospitals, food processing plants, grocery stores.
Country	Poland
Geographic level of implementation	national
Year of implementation	2015

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.

FOOD SUPPLIERS



Food manufactures



logistics companies



food wholesalers



grocery stores

RECIPIENT OF FOOD



catering companies



school canteens and hospitals



workplaces



grocery stores



On the portal Food Outlet food suppliers can post a list of products to sell and assign an appropriate logistics offer. They can also donate their products to the Food Bank. Recipients can choose products from foodstuffs on the site and determine the details of delivery.

Portal is directed to food manufacturers, logistics companies, food wholesalers, restaurants, catering companies, school canteens and hospitals, food processing plants, grocery stores.

Results: Food manufactures can reasonably manage produced food, minimize production losses, offer cheaper products for consumers. They also have the ability to transfer the goods to a public benefit organization, eg. Food Banks which translates to prevent food waste and increases the prestige of socially odpowiedzialnej company.



2.5.4. Council Sustainable Use of Food

Banki Żywności 



Type of initiative	Food waste prevention of research, education and legislation
Actor responsible for the initiative	Federation of Polish Food Banks
Main target groups	Primary production, processing, wholesale, retail, market, food service sector, consumers
Country	Poland
Geographic level of implementation	national
Year of implementation	2011

Council Sustainable Use of Food is a group of representatives of public institutions, research organizations, industry and social. The purpose of the Council is to develop the principles of rational use of food production, distribution chain, and at the level of consumption in order to prevent unnecessary losses of food. Its activity was under the honorary patronage of the Ministry of Agriculture and Rural Development. Council Sustainable Use of Food set itself the goal to involve institutions and citizens in the implementation of system solutions to reduce the waste of food.

In October 2016, a meeting of the Council for Sustainable Use of Food combined with expert debate "Together, not to waste food." Presented the research of the Public Opinion Research Center on food waste by Polish residents (study face-to-face approx. 900 adult).

Speakers of the meeting were representatives from: Consumer Federation, Federation of Polish Food Banks, Polish Federation of Food Industry, Lewiatan Confederation, Tesco Poland, The Ministry of Agriculture and Rural Development



In March there was a meeting on Project MOST - Model Reduction Loss and Wasting Food with Benefits for Society) - Points Recovery - assumptions of the model to provide food and a panel of experts, "How to avoid food wastage - strategies to improve the performance of donations of food to charities in the area of trade"



- In May 2016 there was a meeting devoted to the celebration of World Food Day 2016 - Organization of the lunch break at school in order to reduce food waste and promote healthy eating.



2.6. International

2.6.1. Love Food, Hate Waste



Type of initiative	Awareness Campaign / Research Activity
Actor responsible for the initiative	Waste and Resources Action Programme (WRAP)
Main target groups	Households, schools
Country	UK
Geographic level of implementation	National
Year of implementation	2007
Website	https://www.lovefoodhatewaste.com/

Starting in 2007 in the UK the aim of the “Love Food, Hate Waste Campaign”, implemented by the non-profit organisation WRAP, was to reduce food waste amounts in households and to improve the separate collection of organic waste. Within the first years numerous studies have been carried out by WRAP to collect basic data to determine what kinds of actions were necessary and feasible and how to evaluate them. Particularly interesting is how WRAP succeeded to use every possible channel to get in contact with consumers (already two years after implementation 53% of British grown-ups were familiar with the subject of food waste). In the course of implementation there have been extensive cooperation with companies (e.g. supermarkets), poster campaigns, radio and newspaper announcements as well as bus-back adverts. They use different social media channels with huge success (51.000 followers on Twitter, 48.000 likes on facebook and 1100 followers on Instagram, the Hashtag #stopfoodlovewaste has been used in over 205.000 postings) and carried out cooking-workshops (Let’s get cooking Clubs) as well as three London wide events like “An Alternative Valentines Banquet” in 2013 for the generation of PR. On their website experts provide tips for proper storage, left-over recipes, expiry-dates and consumers can download a food waste diary to measure their food waste amounts. WRAP also gives information on the benefits of home composting and provides guidelines. In 2014 they also released a so-called “Money-Saving App” that includes a portion and meal planner along with many recipes and allows customers to keep track of the items they already bought and of those they are going to buy.

Although WRAP has not defined certain reduction targets in advance it carried out an evaluation (Interviews and sorting analysis within a defined part of London) in 2013. The results showed that the amount of avoidable food waste was reduced by 14%, some households, which actively tried to focus on food waste prevention because of the campaign, reduced their avoidable food waste amounts by 43%.

2.6.2. Stop Splid Af Mad



Type of initiative	Awareness Campaign
Actor responsible for the initiative	Non-profit consumer Organisation
Main target groups	Households
Country	Denmark
Geographic level of implementation	National
Year of implementation	2008
Website	http://www.stopspildafmad.dk/

The “Stop Splid af Mad” (Stop Wasting Food) movement is implemented through consumers (founder Selina Juul) for consumers to raise awareness on the topic as well as provide households with necessary tools to reduce their food waste amounts. It organizes campaigns and events to generate PR as well as encourages individuals to take action. It is strongly supported by politicians in Denmark and members of the European Parliament. The movement is partner of the FAO initiative Save Food as well as the FAO/UNEP campaign think.eat.save and was partner of the EU-FUSIONS Project.

The movement achieved a high level of recognition through numerous TV, radio and newspaper announcements in Danish media as well as international. The initiative has great success on Facebook with over 59.000 likes, the Hashtag #stopspildafmad has been used over 3000 times on Instagram. A left-over cookbook was published (“Stop spild af mad - en kogebog med mere”) and reached the second place in the Category “Best Sustainable Cook Book of the World” at the Gourmand’s World cookbook awards 2012.

In 2013 and 2014 surveys showed that Danes think more about the food they waste than five years earlier (47% of the respondents), 37% of the respondents noted that they throw away less than five years earlier.



2.6.3. Food: Too good to waste



Type of initiative	Awareness campaign
Actor responsible for the initiative	EPA (Environmental Protection Agency)
Main target groups	Households
Country	USA
Geographic level of implementation	National
Year of implementation	2012
Website	https://www.epa.gov/sustainable-management-food

The US Environmental Protection Agency facilitates through the Food: Too good to Waste - Challenge (FTGTW) the implementation of food prevention programmes in communities. It provides a Toolkit as well as an implementation guide for interested local governments and organizations.

The Toolkit includes a 6-week plan to reduce food waste in households. In week 1+2 participants have to measure and record (volume and/or weight) the food they waste. In phase two (week 3 to 5) they should use different tools to prevent as much food waste as possible. There is a “smart shopping and storage guide” as well as a preparation guide which aims to achieve that participants prepare food as soon as possible. It also includes “Smart Saving” guidelines that prompt to look carefully over leftovers or food items that have a short shelf life. They developed so called “Eat-Me-First” signs that mark a special area in the fridge where those items should be stored so the participants won’t forget about them.

An evaluation report analysed seventeen FTGTW campaigns that took place in 10 US states. It showed that 93% of the participants noted that they are now more aware of food waste in their households. 82% agreed that they would like to continue with the tools and strategies they learned to avoid food waste. One of the studies that were summarized for the evaluation mentioned above showed that respondents considered the “Eat-Me-First” sign as very useful.

There is also a peer-to-peer network available for the community to share lessons learned and facilitate the implementation process, which helps to minimize costs.

2.6.4. Zu gut für die Tonne (“Too good for the bin”)



Type of initiative	Awareness Campaign
Actor responsible for the initiative	Federal Ministry of Food and Agriculture
Main target groups	Household, Schools
Country	Germany
Geographic level of implementation	National
Year of implementation	2013
Website	https://www.zugut fuer dietonne.de/

The large-scale initiative “Zu gut für die Tonne” (“Too good for the bin”) has been implemented by Germany’s Federal Ministry of Food and Agriculture and aims to raise awareness on the topic by providing information on the topic in various ways and through numerous activities.

The website provides well-prepared all relevant information on correct storage, purchase planning and leftover recipes. To raise even more interest and involve costumers actively there are two different self-tests (one for beginners and one for advanced participants). It is particularly interesting to note that the website has also been translated in sign language and in a version that is easier to understand for people with limited language skills, learning difficulties or migration background.

An App has been created to help consumers cope with their surplus food through more than 340 recipes and it includes additional tips on meal planning in advance as well as a storage guide.

In 2015 they started a nationwide competition on food waste prevention. Outstanding, creative and successful performances on all stages of the food value chain are awarded.

Furthermore they support to raise awareness on the topic in schools by providing educational material for teachers and students between 9-15 years.

Together with the German food bank and slow food movement action days take place. Known chefs boil away unsaleable fruits and vegetables from supermarkets and agricultural operations.



2.6.5. Feed Back



Type of initiative	Food redistribution activity/ Awareness campaign
Actor responsible for the initiative	Feed Back
Main target groups	Primary production, households, wholesale/retail
Country	United Kingdom
Geographic level of implementation	National (with global impact)
Year of implementation	2009
Website	http://feedbackglobal.org/

The London based organisation “Feed Back” founded by Tristram Stuart became known through the “Feeding the 5000” campaign they started in 2009. This campaign aims to raise awareness to food waste through preparing a meal for over 5000 people that is made out of food that would have been wasted otherwise with the help of volunteers. Up till today “Feeding the 5000” events took place in numerous cities around the globe saving more than 28 tonnes of food and bringing together organisations that aim to reduce food waste along the food supply chain.

Furthermore there exist four other campaigns tackling food waste: 1) *The Gleaning Network*, which aims to build up a network between volunteers, growers and food redistribution charities (gleaned more than 142 tonnes of fruits and vegetables in Europe) 2) the *Pig Idea*, which aims to put the idea of feeding food waste to live stock on the political agenda and encourage the use of food waste that is already legally permissible, 3) Stop Dumping, which aims to call attention to unfair trading practices that cause high amounts of food waste on primary production and food processing level, 4) the FSE (Food Surplus Entrepreneurs)-Network, which is part of the EU-Fusions project and funded by the European Commission, aims to bring together food surplus entrepreneurs with organisations that try to find and build solutions on food waste.

Feed Back aims to build networks around the world and offers expert-advice to political actors and other decision makers.



2.6.6. Food Waste Reduction Alliance Project



Type of initiative	Operational measure, Food redistribution
Actor responsible for the initiative	Food Waste Reduction Alliance
Main target groups	Wholesale/Retail, Food service sector
Country	USA
Geographic level of implementation	national
Year of implementation	2011
Website	www.foodwastealliance.org/

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. It operates with the support of the US-food sector's leading trade associations. They aim to achieve three main objectives: Reducing the generated food waste, increasing the quality of donated food and prioritise recycling of unavoidable food waste.

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. They react through their "Best Practices and Emerging Solutions Guide" of 2014/15 to barriers of food waste donation and recycling found in the previous studies and provide a toolkit with best practice examples for interested companies. Every month one member company is asked to report their effort to provide information and updates for the other companies.



2.6.7. Food Recovery Network



Type of initiative	Food redistribution activity
Actor responsible for the initiative	Food recovery Network
Main target groups	Universities, Food Service Sector
Country	USA
Geographic level of implementation	National
Year of implementation	2011
Website	www.foodrecoverynetwork.org/

Starting with a small group of students at the University of Maryland in 2011, who began to donate the leftovers from their dining hall food, the Food recovery network (FRN) today is a

501(c)3-certified national nonprofit organisation. There is a network of 191 chapters (65 new members in 2015!) in 43 states redistributing food from about 340 donors to 260 food redistribution charities with the help of 3000 volunteers.

The last annual report (15/16) shows that 250 tonnes (40% increase comparing to the previous year) of food waste have been avoided in one year. Since 2011 they recovered and donated 600 tonnes of food.

FRN aims to have a positive impact both on food donors, because they start to reduce their food waste by optimizing their offer and the amounts they purchase and on community partners, because they gain knowledge about using resources and dealing with surplus food.



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