RES-FOOD

METHODOLOGICAL FRAMEWORK

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ReS-Food
Reducing Food Waste and Rescue Surplus Food Supplies

Erasmus + KA2: Partnerships for Cooperation

Project Number: 2022-1-RS01-KA220-VET-00008846

Document Title:	**PR2.2 ReS-Food Methodological Framework**
Project Result:	**Development of ReS-Food Methodological Framework**
Author Partner(s):	University of Novi Sad
Date of Issue:	10.08.2023
Status:	V3.0
Date of Delivery:	31.08.2023
Number of Pages:	70
Contributors to document:	ReS-Food project consortium
Quality Reviewer (if any):	ReS-Food project consortium
Confidentiality Status:	Public

Co-funded by the European Union

The European Commission support for the production of this publication does not constitute an endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

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1. Introduction

Food waste is a pressing concern globally. In the EU alone, approximately 88 million tons of food are discarded each year across all stages of production and consumption. This wastage negatively affects the economy, society, and the environment. To combat these issues, a collaborative approach between stakeholders in the food supply chain and humanitarian organizations is proposed to reduce food waste and food losses and optimize resource use.

By diverting edible food from going to waste and redirecting it to vulnerable populations, collaborative efforts can play a pivotal role in addressing food insecurity and hunger. This redistribution of surplus food ensures that essential sustenance reaches those who struggle to access nutritious meals, ultimately improving their health and well-being. Moreover, during times of crisis or emergencies, such initiatives enhance societal resilience. Collaborations between food producers, distributors, retailers, consumers, and humanitarian organizations can lead to a more efficient and coordinated food supply chain. Such partnerships foster innovative approaches for handling and redistributing surplus food, optimizing resource utilization, and minimizing wastage. The establishment of these connections enhances overall resource efficiency within the food system.



Another important aspect is the environmental impact. Food waste in landfills generates methane, a potent greenhouse gas contributing significantly to climate change. Collaborative efforts effectively reduce greenhouse gas emissions by diverting food from landfills and redirecting it to donation activities.

Consequently, these endeavors support global initiatives to combat climate change and promote environmental sustainability.

Addressing the multifaceted issue of food waste requires a collective and collaborative approach involving all stakeholders along the food supply chain.

Our research indicates that providing targeted training could have significant benefits in addressing the issue of food waste across the Food Supply Chain. This includes recognizing the environmental impact of wasted food, understanding factors that contribute to food loss, identifying solutions to mitigate waste, and developing operational strategies to reduce food loss, including donation initiatives. It's important to remember that ***food waste is not only a practical issue but also a moral one***, as nearly 12% of the global population suffers from hunger. Considering the logistical challenges that contribute to food loss and exploring digital technologies as potential solutions are also important aspects to consider. Based on the answers in the Food Rescue Assessment, it can be stated that the most frequently used difficulty in the food donation process is the lack of a coordinated system – there is no common platform where both actors, the food donator companies (restaurants, supermarkets, hotels, cafes) on one hand, and charities/NGOs/municipalities could communicate with each other.

Another problem is the hectic nature of the whole process. The quantities of surplus portions are unpredictable, and ad hoc reactions are needed. These ad hoc decisions are affecting also the extra work that the employees have to do in connection with the surplus food donation. Once the donation becomes a routine, companies must have rescheduled/adapt workflows for employees involved in the food donation process. Other problems are lack of infrastructure (storage, transportation means), lack of time, lack of personnel, bureaucracy, complex regulatory obligations, and weather issues.

The most common reasons for food surplus during food preparation are production overruns, miscalculations, quality control, and human error. These factors indicate a lack of planning, coordination, and accuracy in the food preparation process. On how to ensure compliance with relevant regulations and standards related to food donation and distribution, some conclusions are as follows:

- Familiarity with local, state, and community regulations and guidelines is the most common and important practice among food donors and recipients.
- Developing policies and procedures to ensure compliance is also a widely adopted measure, particularly for large-scale food donation operations.
- Providing staff training on the storage and handling of donated food is a key aspect of ensuring food safety and quality throughout the food donation chain.

To effectively handle food donations, a form of support is necessary, such as additional information, training, or increased awareness. It has been expressed that there is a clear need for this support, as there may be gaps in knowledge or skills when it comes to managing food donations.

The Res-Food project will develop different results aiming to:

- Provide training and awareness to all actors that are engaged from food production to food consumption to acquire skills for assessing food loss and food waste, designing prevention measures (including policies, procedures, strategies, etc.), and monitoring the effectiveness of these measures. This will help organizations along the food supply chain to reduce their overall food loss and food waste quantities.

- Bridge companies from all the supply chain sectors that potentially generate surplus food with humanitarian actors (NGOs, Parishes, Municipal Actors, etc.) that have established food donation activities in place and could redistribute excess food quantities for human consumption to needy individuals (dependent on the social welfare system, long-term unemployed, poor people, homeless, in debt or with serious financial problems). Employees or engaged individuals (e.g. volunteers).

- Provide training to humanitarian organizations in obtaining surplus food and establishing guidelines for safe food donations. By equipping these organizations with the knowledge and skills to efficiently connect with various actors along the food supply chain, they can effectively access and redistribute surplus food to those in need. Additionally, establishing clear guidelines for safe food donations ensures that the donated food is of high quality and safe for consumption, promoting public health and preventing potential risks. Through these measures, humanitarian organizations can play a vital role in mitigating the negative impacts of food waste on the economy, society, and the environment, while also providing vital support to vulnerable populations, contributing to a more sustainable and compassionate food system.

The **ReS-Food Methodological Framework** is the second output of the RES-FOOD project. It is based on a three-dimensional step-by-step methodology built to manage the food rescue chain end-2-end. In the context of a three-dimensional methodology (food supplier-charity-those in need) for managing the food rescue chain end-to-end, framework will include:

- assessing locations and infrastructure involved in the food rescue process (considerations of distances, transportation routes, and storage facilities, etc),
- assessing the timing and scheduling aspects of the food rescue chain (food availability, timing of collection and distribution, etc),
- coordination, communication, and partnerships among various stakeholders in the food rescue process.

The following ReS-Food Methodological Framework dimensions will assist the companies/organizations to optimize generating food loss and waste as well as the humanitarian actors distributing donated food.

The main goals of the **ReS-Food Methodological Framework** are to approach to **identify**, communicate purpose, and select **surplus food producers**, define quality **acceptance criteria** per food category, and provide **logistical support** requirements for food collection and distribution.

2. ReS-Food Methodological Framework

2.1 The State Analysis Assessment report conclusions

Previously conducted large-scale assessments and prepared reports highlighted an important sample with the most recent and updated information on the situation of food donation and distribution at the European level. It is important to notice that the results of the assessment indicated that the needs of this business sector coincide with the objectives of the Res-Food project. Through the evaluation of the obtained responses, we have identified the main needs which are as follows:

- the need to provide training and awareness raising for all stakeholders from food production to food consumption to provide them with a comprehensive plan with the necessary skills to assess food loss, plan food loss prevention measures,

- to bridge the communication gap between companies throughout the supply chain that potentially generate food losses with humanitarian actors that have established food donation activities and could redistribute surplus food for human consumption to needy people.

2.2 Introduction to ReS-Food Methodological Framework



Source: own construction

The specific goals related to the ReS-Food Methodological Framework are to:

- Define all the tools and techniques necessary to create a successful food distribution process for the Charity Organizations.
- To make it easier for producers and consumers of surplus food to adhere to the pertinent regulations established by the EU regulatory framework (such as those regarding food safety, food hygiene, traceability, and liability),
- To encourage uniform interpretation of EU regulations governing the distribution of surplus food by regulatory bodies in EU Member States
- Improve the capacity of decision-makers (executives, managers, and directors) to strategically plan Food Distribution in their operation

The aforementioned goals will help the target groups to create and put into practice new business strategies that will encourage the implementation of safer and more convenient methods for donating and distributing quality food into their operations. In the future, the ReS-Food methodology will be included in different tools that are delivered as part of other project results and provided to a wide range of Charity organizations and other stakeholders. Furthermore, ReS-Food methodology users will be able to define quality parameters for detection and mapping, quality management for the NGO that distributes the food, quality management for the company that provides the food supplies, and learn about the logistical support needs for food collection and distribution.

White collar employees (executives: CEO, Managers, Directors, Environmental Officers, Operations Managers) will be able to plan, organize their time and activities, gather resources, and then draw a map with the criteria they should implement to reach the level of food distribution that EU regulations and best practices set.

A company or organization could use the ReS-Food Methodological Framework as a road map to discover how to get where it wants to go. The Framework highlights assessing strengths, weaknesses, opportunities, and threats, and then planning future operations in a prioritized and realistic manner.

By implementing the framework, organizations can improve sustainability, reduce costs, and contribute to addressing global food security and humanitarian needs.

A full understanding of relevant EU (or national) legislation and norms concerning food collection, transportation, storage, and distribution is the first step in the successful implementation of the food collection and distribution process. The following EU and national documents could be found relevant:



https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52017XC1025(01)

https://29september.eurofoodbank.org/wpcontent/uploads/2020/09/Infographics_EN.pdf

https://food.ec.europa.eu/safety/food-waste/eu-actions-against-food-waste/food-donation_en

https://food.ec.europa.eu/system/files/2021-05/fs_eu-actions_action_platform_key-rcmnd_en.pdf

https://www.paragraf.rs/propisi/zakon_o_donacijama_i_humanitarnoj_pomoci.html

https://www.paragraf.rs/propisi/zakon-o-porezu-na-dodatu-vrednost.html

https://narodne-novine.nn.hr/clanci/sluzbeni/2013_06_81_1699.html

https://narodne-novine.nn.hr/clanci/sluzbeni/2018_12_118_2343.html

https://narodne-novine.nn.hr/clanci/sluzbeni/2019_09_91_1811.html

https://www.fao.org/fao-who-codexalimentarius/about-codex/members/detail/en/c/15564/

https://narodne-novine.nn.hr/clanci/sluzbeni/2022_12_156_2535.html

https://www.fao.org/fao-who-codexalimentarius/about-

codex/members/detail/en/c/15564/

https://narodne-novine.nn.hr/clanci/sluzbeni/2022_12_156_2535.html

Commission Notice – EU guidelines on food donation (2017/C 361/01):

https://eur-lex.europa.eu/legal-content/HU/TXT/?uri=uriserv:OJ.C_.2017.361.01.0001.01.HUN&toc=OJ:C:2017:361:TOC#ntr62-C_2017361HU.01000101-E0062

Commission Notice providing guidance on food safety management systems for food retail activities, including food donations 2020/C 199/01 C/2020/2941:

https://eur-lex.europa.eu/legal-content/HU/TXT/?uri=uriserv:OJ.C_.2020.199.01.0001.01.HUN&toc=OJ:C:2020:199:TOC

A guide to preventing food waste in the food industry:

https://portal.nebih.gov.hu/documents/10182/1218772/maradeknelkul_utmutato_ELELMISZERIPAR_webes.pdf/580e6f4d-b9b9-4756-02ce-0481970c3e05

A guide to preventing food waste in the commercial sector:

https://portal.nebih.gov.hu/documents/10182/1218772/maradeknelkul_utmutato_KERESKEDELEM_webes.pdf/3e2165d8-c04f-bee3-0fdb-cf1d1e230897

ReS-Food Methodology Framework could be summarized in several activities which include:

- **Assessment of Current Company/Organization Practices**



The first step is to conduct a comprehensive assessment of the current practices within the company/organization or humanitarian context. This includes evaluating the processes involved in food production, handling, storage, transportation, and distribution. Identification of key areas where food loss and waste occur and determination of the reasons behind them. Similarly, the existing methods of donated food distribution should be examined, including logistics, storage, and monitoring mechanisms. Conducting Food Waste Audit: Detailed food waste audit is necessary to quantify and understand the types and quantities of surplus food generated. This assessment will help in identifying patterns, root causes, and potential areas for improvement. Data on food types, quantities, reasons for surplus, and frequency of occurrence are to be recorded and discussed.

- **Set Goals and Targets**

Based on the assessment, specific goals and targets for reducing food loss and waste generation should be established, handling of the food surplus should be evaluated, as well as improving the effectiveness of donated food distribution. These goals should be measurable, time-bound, and aligned with the company/organization's overall objectives and sustainability initiatives. Thus, continuous improvement is possible through a system of regular monitoring and reviewing the progress made toward the set goals. It is important to analyze obtained data, identify areas for improvement, and implement necessary adjustments to optimize food loss, food surplus generation and donated food distribution.

- **Prevention and Minimization**

Implement strategies to prevent and minimize food loss and waste generation. This may include:

- Improving inventory management systems to reduce overstocking or expiration of perishable items.
- Enhancing packaging and storage techniques to maintain product quality and extend shelf life.
- Implementing efficient production planning and forecasting to avoid overproduction and subsequent waste.

- Educating staff and raising awareness about the importance of reducing food loss and waste through training programs and communication campaigns.
- Identification of Surplus Food Sources. The areas within the company where surplus food is generated should be identified and mapped. This may include a wide range of different production facilities, markets, employee cafeterias, event venues, or any other areas where food is prepared or served. Comprehensive identification of surplus food sources and adequate measurement of surplus food quality and quantity is of utmost importance in efficient Food Rescue Quality Management.

❖ Food Donation Management

Management of donated food is highly important to ensure efficient distribution and waste minimization. Partnerships with food banks, charities, and other relevant organizations are crucial to achieve effective coordination. Furthermore, the company/other organization should set up standard operating procedures (SOPs) for donated food handling, storage, and distribution and implement robust monitoring and evaluation mechanisms to track the quantity, quality, and utilization of donated food and all together in the end, measure impact and efficiency of the donated food distribution process.



❖ Capacity Building

Capacity Building represents investment training and programs for employees, suppliers, and partners to enhance their understanding of food loss, food surplus generation, and waste reduction strategies, as well as efficient donated food management practices. ReS-Food Methodology Framework, as one of the available solutions, offers a free concept providing training and awareness raising for all stakeholders from food production to food consumption by presenting a comprehensive plan with the necessary skills to assess food loss and plan food loss prevention measures. Furthermore, technology adoption solutions are also important to optimize food loss, food surplus generation, and waste reduction and offer a possibility to improve the donated food distribution process. Different data-driven systems for inventory management, demand forecasting, and production planning as well as tracking and traceability technologies offer exceptionally effective ways to monitor the movement of donated food and identify potential bottlenecks.



Dissemination and Communication

A robust reporting mechanism to track and communicate the achievements and impact of food loss, food surplus generation, and waste reduction efforts, as well as the effectiveness of donated food distribution is recommended. Sharing transparently obtained information with stakeholders, customers, and the public demonstrates a commitment to sustainability and social responsibility. The Company/Organization should highlight the achievements and impact of the program through internal communications, company newsletters, and external platforms (newspapers, social media networks, etc.) to motivate continued engagement and recognize the efforts invested. By fostering a culture of responsibility and sustainability throughout the organization and wider network, the multiplier effect and chain-reaction mechanisms are introduced and supported.

ReS-Food Methodological Framework will help companies/organizations and humanitarian actors to optimize their practices, reduce food loss and waste generation, and enhance the efficiency of donated food distribution. The ReS-Food approach promotes sustainability, and economic benefits, and addresses global food security challenges while contributing to humanitarian goals.

2.2.1 Approach to Identifying, Communicating the Purpose, and Selecting Surplus Food Producers – referring to Food Suppliers and Charity Organisations

To successfully engage surplus food producers who are willing and able to contribute to surplus food redistribution activities, a systematic method is used for identifying, explaining the purpose of, and choosing surplus food producers. This cooperative strategy would help build a strong network of surplus food producers and advance a

more equitable, sustainable, and waste-free food system that also lowers hunger and protects the environment.

2.2.1.1 Approach to Identifying Surplus Food Producers – referring to Charity Organisations

Ho.Re.Ca. (Hotel, Restaurant, and Catering), supermarkets and other food chains are examples of surplus food producers since they create extra or unused food that may be distributed to reduce food waste. Surplus food producers' size, location, and operational procedures can differ.



Hotels, restaurants, catering companies, cafés, and other food service establishments that provide food services are all included in the ***Ho.Re.Ca. sector***. ***Hotels*** sometimes contain sizable kitchens and banquet spaces where extra food may be produced as a result of changes in occupancy rates, postponed events, or overproduction during meal preparation. ***Restaurants*** may have excess food owing to changes in consumer demand, changes to the menu, or overestimation of the amount of food needed to prepare a meal. If the predicted attendance is fewer than expected or if there are cancellations, ***catering companies*** that serve meals for events, conferences, and parties could have excess food. Serving clients with wholesome, freshly prepared food and drinks is frequently a top priority for ***cafés***. They could make meals and drinks in tiny amounts throughout the day to guarantee freshness. However, cafés may have more food than they need if client demand is lower than anticipated or if particular menu items are not as well-liked as predicted.



The establishments like ***supermarkets*** and ***food chains*** provide a variety of food products. Due to things like product expiration dates, visual flaws, faulty packaging, or overstocking, ***supermarkets*** may produce excess food. Perishable foods, baked goods, and packaged goods that are still safe for eating may go unsold as a result. ***Fast food chains***, ***fast-service restaurants***, and ***large-scale food chains*** may produce surplus food as a consequence of changes in consumer demand, mistakes made during the production of the food, or marketing campaigns that produce excess inventory. ***Facilities*** **that** ***manufacture and process food*** can also create surplus food. These factories create packaged goods, processed foods, and ingredients for Ho.Re.Ca. sector, supermarkets, and other food chains. Overstocking, poor product labeling, inefficient manufacturing lines, or adjustments in consumer preferences might all result in surplus food.

It is possible to create targeted plans for excess food recovery, redistribution, and waste reduction by identifying surplus food producers in the Ho.Re.Ca. industry, supermarkets, and food chains. The responsibility of identifying surplus food producers in the Ho.Re.Ca. sector, supermarkets, and food chains typically fall on ***charitable organizations***, ***food banks***, ***non-profit organizations*** (***NGOs)***, or other entities involved in food recovery and redistribution efforts. These organizations actively engage in partnerships and collaborations with Ho.Re.Ca. industry, supermarkets, and food chains to identify potential surplus food sources. The abovementioned establishments may efficiently identify surplus food producers in the Ho.Re.Ca. sector, supermarkets, and food chains and put into practice ways to decrease waste, optimize inventory, and enhance sustainability practices by combining the following approaches.

❖ **Research and Information Gathering**

Market research is critical for understanding the local food industry scene, which includes the existence of Ho.Re.Ca., supermarkets, and other food chains. This is followed by data collecting on the number, size, and type of establishments in each sector. The final phase is to collect information on industry trends, consumption habits, and possible contributors to food excess.



Before engaging with surplus food producers, individuals from charitable organizations and other entities should conduct thorough research on the specific producers and their operations. This includes understanding their production processes, supply chains, inventory management practices, and any existing initiatives aimed at reducing surplus food. Gathering this information helps in tailoring education efforts to the specific needs and challenges faced by each producer.

❖ **Collaboration with Business from Ho.Re.Ca. Sectors, Markets, and Other Food Chains**

Charitable organizations, food banks, NGOs, or other entities involved in food recovery and redistribution efforts should initiate collaborations with businesses in the Ho.Re.Ca. sectors, markets, and other food chains. It is of great importance for people from these establishments to attend industry events, conferences, and seminars to meet and engage with professionals from the Ho.Re.Ca. sector, supermarkets, and food chains. This represents the path to the realization of strong relationships with suppliers, distributors, and wholesalers who serve these sectors, as they can provide insights into surplus food generation.

Employees, especially those involved in food preparation or inventory management, can offer their views, comments, and feedback on possible surplus food production inside the organization since the purpose of the Methodology is to bridge companies from all sectors of the supply chain that potentially cause food loss with humanitarian actors (NGOs, parishes, municipal bodies) that have established food donation activities and could redistribute excess amounts of food for human consumption to those in need individuals.

In addition, in order to achieve the goal, all actors involved from food production to food consumption must be trained and sensitized in order to acquire the required skills to assess food loss, plan food loss prevention measures and monitor food loss measures. This will help hotels, restaurants and cafes to reduce the overall amounts of food loss and thus mitigate the associated negative impact on the environment.

- **Questionnaires**

Conducting questionnaires with employees from Ho.Re.Ca. sector, markets, and food chains to identify potential surplus food sources is of great importance. The questionnaire enables gathering data on their food production, inventory management practices, and patterns of surplus generation.

- **Surplus Food Audits**

When collaboration is established, the next step is conducting surplus food audits in the Ho.Re.Ca. sector, supermarkets, and other food chains which entail measuring and assessing food waste created. This can be accomplished by weighing and classifying rejected food items, keeping track of plate waste, or assessing unsold merchandise. Establishments can uncover patterns and assess if they are creating a surplus by measuring the amount of wasted food.

- **Analysis of Sales and Demand**

Analyzing sales data and demand trends is critical for detecting surplus food producers in the Ho.Re.Ca. sector, supermarkets, and other food chains. Establishments can discover situations where extra food is routinely produced and goes unsold by comparing sales numbers to expected or past demand.

- **Contact with Suppliers**

It is critical to have open lines of contact with suppliers to determine production levels and quantities delivered. It may help organizations to identify whether their suppliers routinely offer more food than is requested, perhaps resulting in surplus food.

2.2.1.2 Communicate the Purpose of Surplus Food Donations –referring to Food Suppliers and Charity Organisations



The purpose of communicating the importance of food surplus donations is to raise awareness, engage the community, and encourage active participation in addressing the critical issues of food waste and hunger. The following main factors might be stressed while describing the objective of food surplus donations:

Food Waste Preventing: It is critical to explain the importance of food surplus donations in preventing edible food from going to waste. Individuals and organizations may ensure that perfectly good food reaches those in need rather than end up in landfills by donating excess food. The environmental impact of food waste and the need to reduce it for a more sustainable future must be emphasized in this communication.

Alleviating Hunger: It should be stated that food surplus donations directly address food insecurity and aid in the alleviation of hunger in local areas. Many people and families struggle to find nutritional meals, and leftover food contributions can make a big difference in their life. Individuals and organizations can make a significant difference in eliminating hunger and improving food access for vulnerable communities by donating excess food.

Supporting Local Communities: It is important to underline the good impact that food surplus contributions have on local communities. Surplus food donations can help local food banks, shelters, and community organizations, establishing social relationships and a sense of solidarity. Individuals and companies that donate extra food can help their neighbors and build a stronger, more resilient community.

Promoting Sustainable Practices: It is important to emphasize that food excess donations are consistent with sustainable practices and appropriate resource management. Donating excess food helps to reduce demand for new food production, conserves natural resources, and reduces the carbon footprint associated with food waste. Surplus food donations may contribute to a healthier Earth for future generations by fostering sustainability.

Communication between charitable organizations, food banks, NGOs, or other entities involved in food recovery and redistribution efforts and the wider community, as well as food surplus producers from the Ho.Re.Ca. sector, markets, and other food chains are crucial for effective collaboration and awareness.

Communication with the ***wider community*** aims to increase awareness, educate, engage, and motivate community members to participate actively in food waste reduction programs. This communication should help to develop a community-wide movement toward a more sustainable and efficient food system by instilling a feeling of communal responsibility and supporting sustainable habits.

Communication with ***surplus food producers*** in the Ho.Re.Ca. sector, supermarkets, and other food chains are critical for raising awareness, promoting understanding, and encouraging support for their efforts. They can make substantial progress toward reducing food waste and developing a more sustainable and efficient food system. The following may be the key purposes of this communication:

- **Transparency and Outreach**

Transparency and outreach to the wider community and surplus food producers about surplus food from the Ho.Re.Ca. sector, markets, and other food chains are critical for fostering collaboration, building confidence, and ensuring effective surplus food management.

Establishing communication with the Wider Community: Charity organizations and other entities involved in reducing surplus food should connect with the general public to raise awareness about the problem of food waste, its environmental effect, and the social and economic consequences. Wider communities may include individuals, families, community groups, companies, educational institutions, and local government entities. The various communication channels can be used to reach a wide audience. Print media, television, and radio are examples of conventional means, as are digital platforms such as websites, social media, email newsletters, and mobile applications. Using many channels enables more information distribution and engagement with varied community members.

Establishing communication with Surplus Food Producers: It is crucial to build relationships with surplus food producers by reaching out to them directly or through industry networks and associations. Communication facilitates collaboration and partnership between charity organizations and other entities stakeholders and stakeholders in the Ho.Re.Ca. sector, supermarkets, and other food chains.

By engaging in open dialogue and sharing knowledge and expertise, these stakeholders can work together to develop effective strategies and initiatives to reduce food surplus.

Individuals with experience in food waste reduction may share their insights, new techniques, and successful initiatives with stakeholders in the Ho.Re.Ca. sector, supermarkets, and other food chains. In turn, individuals from the Ho.Re.Ca. sector, supermarkets, and other food chains may contribute industry-specific information and experiences, fostering a collaborative learning environment that promotes continual development and innovation in the reduction of food surplus.

- **Education and Motivation**

Education and motivating the wider community and surplus food producers about food donations are crucial steps in promoting and increasing participation in surplus food recovery and redistribution efforts.

Behavior change and awareness of the wider community: It is very important to emphasize that surplus food producers may aid in the alleviation of hunger, the assistance of vulnerable populations, and the reduction of food insecurity within communities. The involved people or groups may educate the community in understanding the necessity of limiting food waste and exploiting excess food resources by giving information on the volume of surplus food available and its potential for redistribution.

Communication may help to educate the wider community about practical measures to decrease food waste in their everyday life. Individuals or groups of people from different institutions or organizations may help community members realize how they can make a good influence by altering their behaviors and habits by giving ideas, guidance, and best practices. Effective communication should encourage the adoption of environmentally friendly activities such as appropriate meal planning, smart buying, adequate storage, and creative use of leftovers.

Effective communication may help build a culture of sustainability within the wider community. By promoting the values of environmental stewardship, social responsibility, and resource efficiency, individuals can inspire a shift in attitudes and behaviors toward reducing surplus food. Over time, communication efforts can contribute to a broader shift in societal norms, making waste reduction a common and widely accepted practice within the community.

Motivating and Training of Food Producers: The dissemination of information plays a vital role in raising awareness among stakeholders from the Ho.Re.Ca. sector, supermarkets, and other food chains about the issue of food surplus and its consequences. Surplus food producers should be provided with data and insights on the scale and impact of food waste within their industry and the broader food system. Individuals from charity organizations and other entities should present information on the economic, environmental, and social consequences of surplus food production,

emphasizing the potential benefits of waste reduction for their bottom line, reputation, and sustainability goals. Increased awareness may help stakeholders from the Ho.Re.Ca. sector, supermarkets, and other food chains understand the urgency and importance of taking action to minimize food surplus and its associated negative effects. The environmental benefits must be emphasized by explaining how reducing food waste helps conserve natural resources, reduces greenhouse gas emissions, and minimizes the ecological footprint of the food industry. It is very useful to show statistics and case studies to demonstrate the positive environmental impact of some stakeholders' practices.

Communication should help build trust and engagement between stakeholders from charity organizations and other entities and stakeholders from the Ho.Re.Ca. sector, supermarkets, and other food chains. Open and transparent communication fosters a sense of shared responsibility, accountability, and commitment to reducing food surplus.

Effective communication can drive behavioral change among stakeholders from the Ho.Re.Ca. sector, supermarkets, and other food chains by promoting the adoption of best practices to prevent and minimize food surpluses. By sharing success stories and demonstrating the positive impact of waste reduction initiatives, individuals from charity organizations and other entities can inspire and motivate stakeholders from the Ho.Re.Ca. sector, supermarkets, and other food chains to adopt similar practices in their operations.



Case studies, testimonials, and interviews with producers who have successfully implemented waste reduction measures can serve as powerful educational tools. Sharing success stories of surplus food producers who have effectively reduced waste can inspire others within the industry and demonstrate that waste reduction is not only achievable but also financially and environmentally beneficial. The economic benefits and cost savings associated with reducing food surplus can encourage stakeholders from the Ho.Re.Ca. sector, supermarkets, and other food chains to prioritize waste reduction measures.

Organizing training sessions and workshops specifically designed for surplus food producers could be very useful. Topics covered in these courses may include waste assessment, process optimization, inventory management, and responsible manufacturing practices. Hands-on activities, case studies, and real-life examples should enhance the learning experience and encourage stakeholders from the Ho.Re.Ca. sector, supermarkets, and other food chains to apply the knowledge to their operations.

❖ **Involving in Advocacy and Policy Influence**

Through effective communication, the wider community and surplus food producers may be engaged in supporting policy reforms that promote food recovery, enhance food safety regulations for surplus food donation, and create incentives for businesses to minimize waste and donate surplus food. Through collective voices and advocacy, the wider community and surplus food producers can influence policymakers to prioritize and support initiatives that address food waste at local, regional, and national levels.

❖ **Collaboration with Influencers**

Collaboration with influencers entails working with influential people, bloggers, or social media influencers who are enthusiastic about sustainability, food waste reduction, and social problems. Collaboration with these individuals may amplify the message and reach a larger audience, raising awareness and support for surplus food producers.

2.2.1.3 Selection of Surplus Food Producers – referring to Food Suppliers and Charity Organisations



The selection of surplus food producers in Ho.Re.Ca. sector, markets, and other food chains typically fall under the responsibility of multiple stakeholders, including food redistribution organizations, procurement departments of food chains, and sustainability teams. Food redistribution organizations, such as food banks or charity organizations specializing in excess food recovery, play an important role in identifying surplus food producers. These groups work actively with companies to form partnerships for surplus food donation and redistribution.

Selecting surplus food producers in the Ho.Re.Ca. sector, supermarkets, and other food chains require a systematic approach to ensure that surplus food producers align with their goals, have the capacity for surplus food redistribution, and contribute to reducing food waste effectively. The approach to selecting surplus food producers may include:

❖ **Food Safety**

Charity organizations and other entities should evaluate numerous factors when selecting surplus food producers with whom to work to achieve effective and efficient surplus food redistribution. One of the most important is adhering to stringent food safety and hygiene regulations to ensure the quality and safety of donated food. Organizations usually require producers to follow local and national food safety rules, use suitable storage and handling techniques, and undergo frequent inspections and audits.

- **Quantity and Variety of Surplus Food**

The quantity and variety of the surplus food supply are important considerations. Larger volumes of surplus food provide a greater effect and the potential to serve a greater number of recipients. Reliable and predictable surplus food availability allows the food chain to plan effectively for distribution and minimize food waste. Furthermore, a wide variety of surplus food items, including fruits, vegetables, grains, proteins, and dairy, guarantees that beneficiaries obtain a well-balanced and healthy diet.

- **Freshness and Shelf Life**

Surplus food producers should offer fresh and high-quality products with reasonable remaining shelf life. Food chains prefer surplus food that can be used quickly to minimize food waste. Producers who have effective inventory management systems and prioritize timely distribution are valuable partners.

- **Transparency**

Producers must keep detailed records and be prepared to give information on the origin, handling, and storage of extra food. Transparency is also required in terms of production procedures, ingredient sources, and any additions or preservatives employed.

- **Ethical and Sustainable Practices**

Producers who exhibit ethical and environmental practices are increasingly being prioritized by food chains. Fair labor policies, responsible sourcing, waste reduction measures, and ecologically friendly production processes are all factors to consider. Producers who have sustainability, organic farming, or fair trade certifications or efforts may have an edge.

- **Reliability and timeliness**

Producers must be dependable and supply extra food on schedule. This enables seamless operations across the food chain and effective distribution. Producers having a track record of dependability and timeliness in meeting delivery deadlines are recommended partners.

- **Cost-effectiveness**

While leftover food is frequently redistributed through gifts or lower pricing, cost-effectiveness remains an essential requirement for food chains. Producers that can sell surplus food at reasonable rates or give cost-saving options for the food chain while maintaining quality are more likely to be chosen.

- **Collaboration and Communication**

Surplus food producers should effectively communicate with redistribution organizations about available surplus food, timely coordination for collection or delivery, and the ability to provide accurate information about the type, quantity, and quality of the surplus food being donated.

- **Location**

A practical aspect is the closeness of surplus food producers to redistribution groups. Producers who are a suitable distance away can help with the effective and timely collection or distribution of surplus food. Accessibility is especially crucial for perishable commodities that must be distributed quickly to ensure freshness and quality.

- **Reputation**

The reputation of surplus food producers, as well as referrals from other food chain partners or stakeholders, are taken into account. Positive comments, referrals, and a track record of successful cooperation may help build trust and confidence in the producer's capacity to satisfy the needs of the food chain.

2.2.2 Quality Acceptance Criteria per Food Category – refers to Food Suppliers



When donating surplus food, it is very important to focus on the safety and quality of the food, ensuring that the donated food is fit for consumption. The properties of the food should not have any harmful effects on the human body during consumption, it should meet its needs, provide a feeling of comfort, etc. Food quality includes a set of

characteristics that consumers evaluate to meet their needs and expectations. Quality policies must be regulated by law at the European or national level (protected designations of origin, geographical origin and traditional specialties guaranteed), but can also be voluntary: institutional (e.g. chambers of commerce), private (producers, retail chains) or international (independent international organizations). In order to protect food consumers, food quality requirements have been established, which can be divided into basic groups: primary requirements, which are based on the protection of consumer health (health safety) and are required by law, and secondary requirements, which include technological, nutritional and sensory requirements, as well as product characteristics. The quality acceptance standards for donating surplus food from the Ho.Re.Ca. sector, markets, and other food chains vary depending on the food category. The most common types of donated surplus food from Ho.Re.Ca. sector, markets, and other food chains are listed below:

- **Perishable Food**

Sensory characteristics of perishable foods are expected to meet the prescribed appropriate food quality and safety parameters. Fruits and vegetables must not have the signs of spoilage, such as mold, rot, or unusual odors. The firmness, color, and appearance of food must be within acceptable ranges. Meat, eggs, and dairy food must not have signs of spoilage, including discoloration, foul smell, or sliminess. In order to ensure the above, it is necessary to pay attention to the storage temperature. The development of harmful microorganisms, the so-called "danger zone", occurs most often at temperatures from 5°C to 63°C, so perishable foods must be stored at temperatures below 5°C, i.e. above 65°C. Vegetables, especially leafy greens, should be stored as far away from the refrigerator condenser as possible to prevent freezing. Food in the refrigerator will dry out - store meat, fish, salad leaves or similar vegetables in airtight food containers or bags. Also, never store tomatoes and lettuce in the same container or near each other, as tomatoes give off gases that cause lettuce to turn brown. Cutting lettuce with a metal knife will cause the leaves to turn brown and become unfit for consumption. To prevent the oil from taking on an undesirable aroma, store it as far away as possible from foods with intense odours. Vacuum packaging of food extends the shelf life of perishable foods such as meat and fish.

- **Non-Perishable Food**

Non-Perishable food includes ***canned goods*****,** such as canned fruits, vegetables, soups, sauces, etc.; ***packaged food*** - snacks, cookies, chips, crackers, etc.; ***dry goods*** - rice, pasta, grains, beans, cereals, etc.; ***condiments*** **-** sauces, dressings, spreads, spices, etc.; ***beverages*****:** bottled water, juices, soft drinks, coffee, tea, etc.

- **Prepared Food**

Prepared food includes ***ready-to-eat meals*** such as pre-packaged meals, sandwiches, salads, wraps, etc.; ***deli items*** - cold cuts, prepared salads, cheese platters, etc.; ***leftovers*** from buffets, banquets, and events.

❖ Baked Goods

Baked goods include **excess bread**, **pastries**, and **baked goods** from bakeries, cafes, and restaurants. For baked goods, it is recommended that they be consumed within 24 hours of receipt from the middleman. It is important to note that baked goods with fillings (e.g., cheese fillings, pizza fillings a la pizza, meat fillings, hot dogs) must be consumed within 12 hours of receipt from the middleman.



❖ Surplus Ingredients

Surplus ingredients include ***excess raw ingredients*** and ***food supplies used for cooking and food preparation***.

❖ Excess Inventory

Excess inventory refers to overstocked or near-expired food goods that are still safe to eat.

Various approaches and indicators are used to detect quality criteria in surplus food from the Ho.Re.Ca. industry, markets, and other food chains. These factors aid in determining the quality and acceptability of surplus food for redistribution. To achieve accurate evaluation and decision-making, individuals participating in surplus food detection and quality assessment must be well-trained. To maintain consistency and enforce food safety standards throughout the surplus food redistribution process, regular monitoring, documentation, and quality control tests are routinely undertaken. The specific quality parameters and detection methods may vary depending on the type of food, local regulations, and organizational policies. Here are some quality parameters that are widely used to detect the condition of surplus food:

Appearance and Color: Visual inspection is used to evaluate the general appearance, color, and freshness of food items. Discoloration and mold are signs of spoilage or deterioration. For example, fresh fruits and vegetables must not have the signs of spoilage, such as mold or rot. The appearance and color must be within acceptable ranges. Meat, poultry, fish, dairy, and eggs must not have signs of spoilage, including discoloration or sliminess. For bulk packs where an egg is broken,

the remaining eggs are safe and suitable for donation. They must be placed in a clean box or other suitable packaging, and if it is not labelled, it must be labelled with appropriate information so that the final recipient has all the necessary information about the food. Bakery food must not contain mold or signs of spoilage.

Odor and Taste: Donated food must not have any offensive or odd scents that could suggest rotting or bacterial growth. Fresh, pleasant scents and appropriate taste are usually expected from high-quality foods.

Texture and Consistency: The texture and consistency of the food are scrutinized to ensure that it has the necessary properties. Bakery food should have proper freshness, with no signs of staleness or dryness, while fruits and vegetables should be firm and meat should have the proper texture.

Packaging and Seals: The packing and seals are assessed for condition. Contamination or loss of product quality may result from damaged or compromised packaging. Seals that are still intact serve to ensure the freshness and safety of the product. Cans that have a slight dent can be donated. Cans that are bloated, leaking, or have a dent so deep that the inside (coating) is damaged and the food in the can may be contaminated must be discarded.

Shelf Life and Expiration Dates: The remaining shelf life or expiration dates are checked to see whether the extra food is suitable for redistribution. The priority is the items with a longer shelf life.

Recommendation:

- it is necessary to check the food visually
- the smell of the food should be characteristic of this type of food
- check if the packaging, which is in direct contact with the food, is damaged and make sure that it does not show signs of bulging, rust, mold, spoilage, insects or foreign objects
- Pay attention to the storage temperature.

There is a difference between: "expiration date" and "best before date" in terms of food safety. Figure 1 shows an example of food labelling intended for donation.

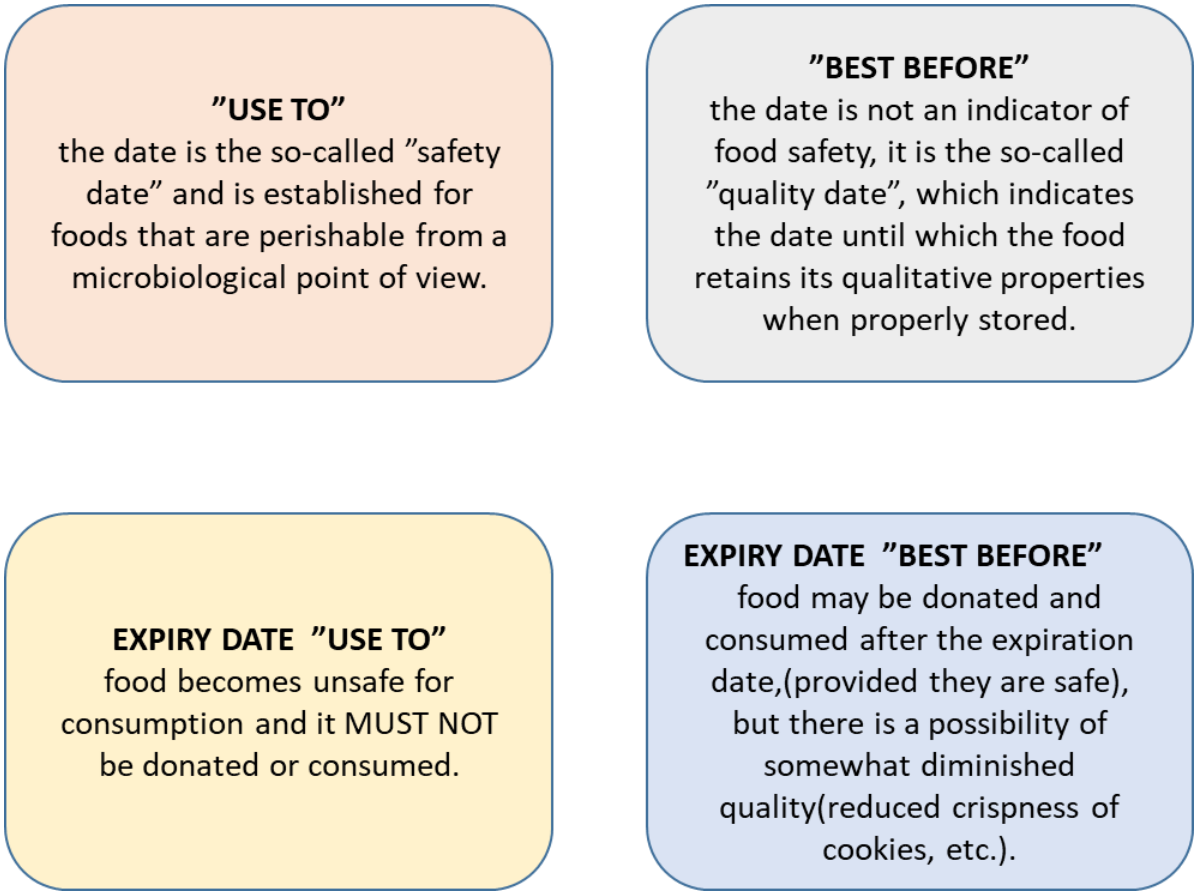


Figure 1. Labelling of food intended for donation

How do we know that food is still safe after the "best before" date?

Recommendation:

- it is necessary to check the food visually
- the smell of the food should be characteristic of this type of food
- check if the packaging, which is in direct contact with the food, is damaged and make sure that it does not show signs of bulging, rust, mold, spoilage, insects or foreign bodies
- pay attention to the storage temperature

Temperature Control: Perishable food should be stored and transported at the proper temperatures to retain its quality and safety. Non-refrigerated (hot, warm) food must be transported at a temperature of ≥ 63 ºC, while refrigerated food must be transported at a temperature of ≤ 4 ºC and stored in a refrigerator at ≤ 4 ºC. The transport time to the intermediary in the food donation chain must not exceed one hour! Warm/hot food is consumed within one hour after receipt of the donation!

Refrigerated food (4 °C) is consumed as soon as possible, but no later than 24 hours after receipt of the donation! Refrigerated foods that are consumed warm must be heated to a temperature of at least 75 °C immediately before consumption. Frozen food must be transported and stored at ≤ -18 °C.

Allergen and Ingredient Information: Clear allergen and ingredient information on the packaging are critical for ensuring food safety and informing consumers about potential allergies.

Compliance with Food Safety Standards: The surplus food should undergo food safety standards and laws, such as correct handling, storage, and preparation techniques. This guarantees that the food satisfies all of the necessary safety criteria.

Feedback from Recipients: Recipients of surplus food, such as charity organizations or food banks, may provide feedback on the quality and suitability of the donated food. This feedback contributes to overall quality assessment and informs future selection and donation processes.

2.2.2.1 Quality Parameters Detection and Mapping of Surplus Food –refers to Food Suppliers and Charity Organisations

To ensure the safety and acceptability of donated food, it is critical to detect and map the quality criteria of surplus food from the Ho.Re.Ca. sector, markets, and other food chains. By implementing robust quality parameters detection and mapping processes, charitable organizations, food banks, and NGOs can ensure that surplus food from the Ho.Re.Ca. sector, markets, and other food chains meet the required safety and quality standards for redistribution to those in need. Food safety is a basic requirement for its quality and was introduced as a term to increase consumer confidence in the food they consume. At the World Economic Forum on Nutrition in Rome in 1996, it was concluded that food security exists when all people at all times have access, both physically and economically, to a sufficient quantity of safe and nutritionally adequate food to meet the nutritional needs for a healthy and active life.

The following are the important steps in this process:

- **Establishing Quality Guidelines**

A food is considered safe for human consumption if it has no adverse effects on human health when consumed as directed. The first step is to develop comprehensive quality guidelines that outline the specific parameters for assessing the quality of surplus food. The important factors include appearance, texture, odor, taste, packaging integrity, expiration dates, and any regulatory requirements. The creation of quality guidelines implies collaborating with food safety experts, regulatory agencies, and industry stakeholders to establish robust and relevant quality parameters. In order to protect the interests of consumers and ensure better information, various mechanisms are used, such as legal regulations, frequent inspections, clearer labeling of food, the introduction of an insurance system, all with the aim of improving the quality of food.

Food quality and safety assurance systems can be mandatory (e.g. HACCP - Hazard Analysis and Critical Control Point) or voluntary (ISO 22000 - International Organization for Standardization, IFS - International Food Standard and BRC - British Retail Consortium). Hazard Analysis and Critical Control Point HACCP is an internationally binding systematic method for determining, evaluating and controlling food safety, which is integrated with all other quality and food safety systems. The ISO 22000 series of standards arose from the food industry's need to create an international standard that would be accepted and recognized in all countries and would address food safety management throughout the chain "from field to table." The standard IFS was developed by German, French and Italian retail chains to control manufacturers of brands of large retail chains. It combines HACCP principles with quality management system requirements and hygiene requirements. The BRC Technical Standard was developed to help retailers meet their legal obligations related to consumer protection. The global umbrella organization that takes care of food safety is the Codex Alimentarius Commission (CAC).

❖ Categorizing Surplus Food

Surplus food should be categorized based on types, such as fruits, vegetables, dairy, grains, or prepared meals. This categorization helps in better understanding the nature of surplus food and facilitates targeted redistribution efforts. Food waste in restaurants accounts for 13% of total food waste. Of this, 30% of food waste is leftovers on the plate, 20% is unprepared dishes, and 15% is fruits and vegetables, as shown in the following graph (Figure 2).

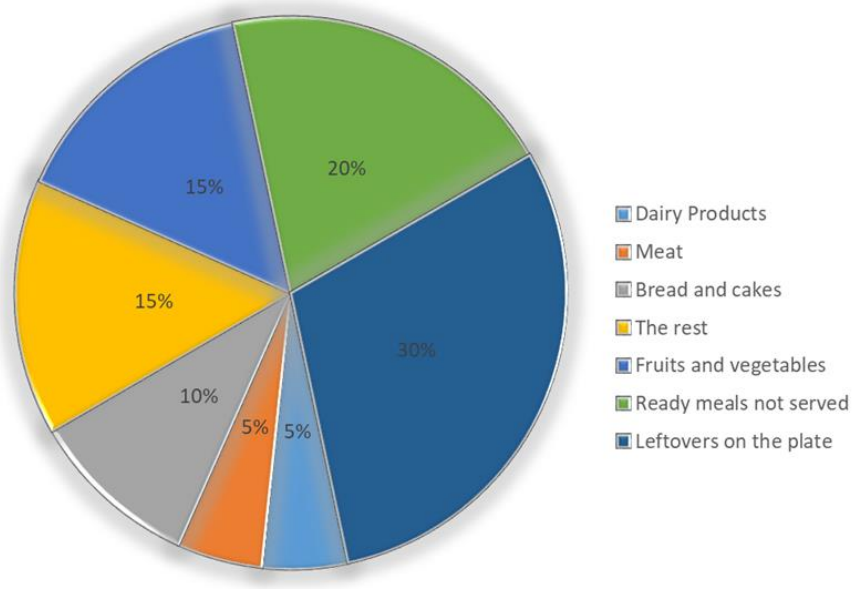


Figure 2. Illustration of the distribution of food waste categories in restaurants

❖ Collaboration with Food Safety Authorities

Collaboration with local food safety authorities and regulatory agencies ensures that necessary food safety standards and regulations are met. Seeking information and

support from food safety professionals may aid in developing proper testing procedures and accurately interpreting the results.

- **On-Site Inspection**

On-site inspections involve assessments of the condition of surplus food at food surplus-producing locations such as restaurants, supermarkets, and food chains. To ensure compliance with food safety laws, storage spaces should be inspected first, followed by handling methods and general cleanliness standards. The on-site assessment also includes assessing the freshness, visual attractiveness, and general condition of the surplus food items to determine their donation acceptability.

- **Testing and Sampling**

Testing and sampling strategy is also used to assess the quality and safety of surplus food. Representative samples should be randomly selected from different food categories for laboratory testing, including microbiological (microbial contamination), chemical (nutritional composition and compliance with food labeling requirements), sensory analysis (appearance, color, odor, taste, texture, consistency, packaging) as well as the presence of allergens.

- **Documentation and Record-Keeping**

Detailed records of the quality assessment process, including inspection findings, test results, and any remedial actions taken should be maintained by using electronic databases or software systems. This is followed by documenting the mapping of surplus food producers, including their location, contact information, and specific food categories they can donate.

- **Continuous Monitoring and Evaluation**

It is very useful to implement the system for ongoing monitoring and evaluation of the quality parameters of surplus food. This includes regularly reviewing and updating the quality guidelines based on feedback, scientific advancements, and changes in food safety regulations as well as conducting periodic audits and assessments to ensure that food surplus producers adhere to the established quality parameters consistently.

2.2.2.2 Quality management for the company that provides food supplies – refers to Food Suppliers

Quality control is essential for companies that supply surplus food supplies from the Ho.Re.Ca. sector, marketplaces, and other food chains. Using good quality management practices ensures that surplus food is safe, satisfies quality standards, and meets the needs of its customers. The donor must provide the intermediary in the food donation chain with all the information about the food on a label or accompanying document, and it must ensure, that the final recipient receives accurate information about the food. The following are significant quality management challenges in such businesses:

❖ **Establishing Quality Assurance Procedures**

To maintain the consistent quality of surplus food supply, quality assurance processes must be developed and implemented. Regular inspections, audits, and appraisals of suppliers, products, and procedures may be required.

❖ **Food Safety and Hygiene Practices**

Throughout the supply chain, strict food safety and hygiene measures must be implemented and followed. To prevent contamination and ensure food safety, adequate handling, storage, transportation, and temperature control are required.

❖ **Product Inspection and Testing**

According to quality parameters detection it is crucial to perform regular product inspections and testing to assess the quality and safety of surplus food supplies. This involves sensory evaluations, laboratory testing, and analysis to identify any potential issues or deviations from quality standards.

❖ **Traceability and Documentation**

To track the origin, management, and distribution of surplus food supplies, robust traceability mechanisms must be built. It is critical to keep accurate records of supplier information, product specifications, quality control inspections, and any other pertinent data.

Traceability of food and food ingredients throughout the food chain is a key element to ensure food safety! Traceability is established through record keeping.

Intermediaries in the food donation chain must ensure so-called "one step back" traceability, meaning they must keep records of who they received the donated food from. In the case of transferring surplus food to another intermediary in the food donation chain, intermediaries must ensure traceability of the so-called "one step forward", i.e. they must keep records of the intermediary in the food donation chain to which they transferred the donated food. In the case of donating food directly to the final recipient, intermediaries do not have to ensure traceability of the so-called "one step forward".i.e. they do not have to record the recipient of a particular donation, only the traceability "one step back", but they must be able to prove that the food received was given to the final recipients.

❖ **Standard Operating Procedures (SOPs)**

Standard operating procedures (SOPs) for many areas of the supply chain, such as receiving, storing, handling, and distributing extra food, should be defined. SOPs establish rules and ensure that processes are followed consistently throughout the organization. Use clean, suitable and, if necessary, disinfected means of transport for food! Maintain a cold/warm chain during transport for foods that must maintain a temperature regime! Keep the warehouse clean, tidy and free of rodents

(extermination!) and prevent access of pets and domestic animals! Pay attention to food storage conditions (room temperature, refrigerated, frozen)! Limited Non-temperature-controlled periods are allowed to facilitate handling during transport, storage, display and serving of food. In rooms where food is stored or handled and in rooms where waste containers are located, the prescribed pest control measures must be implemented.

- **Training and Education**

It is critical to provide comprehensive training to supply chain staff to improve their grasp of quality management, food safety standards, and adherence to relevant regulations. Training and education programs should be designed to promote critical and creative thinking by all participants in the production, processing, and food supply chain. Training programs must be updated regularly to reflect changes in standards and best practices.

- **Compliance with Regulations**

It is expected to stay updated on local, national, and international legislation about food safety, quality management, and labeling standards, as well as to assure full compliance with these regulations to safeguard the integrity of surplus food supplies.

- **Customer Feedback and Continuous Improvement**

It is critical to establish channels for consumer feedback and seek opinions on the quality and contentment of surplus food delivered. This feedback should be used to enhance operations, address complaints, and meet the expectations of customers. Also, this information may help to improve and implement the effectiveness of quality management practices as necessary.

2.2.2.3 Quality Management for the Humanitarian Actor that Distributes the Surplus Food – refers to Charity Organisations

To ensure that the food distributed by NGOs is safe, nutritious, and of good quality, quality management is vital. Implementing excellent quality management procedures aids in the preservation of surplus food and ensures that it satisfies the needs and expectations of those who receive it. By implementing robust quality management practices, NGOs can enhance the safety, nutritional value, and overall quality of the surplus food they distribute. This helps build trust among recipients, donors, and stakeholders while contributing to the reduction of food waste and addressing food insecurity responsibly and effectively. It is recommended that donors enter into cooperative agreements that specify, among other things, the amount of food, the type of food, and the frequency with which the donor can donate food.

Food donors can donate food through intermediaries in the food donation chain or directly to the end consumer. Figure 3 shows the food donation scheme in the two cases above.

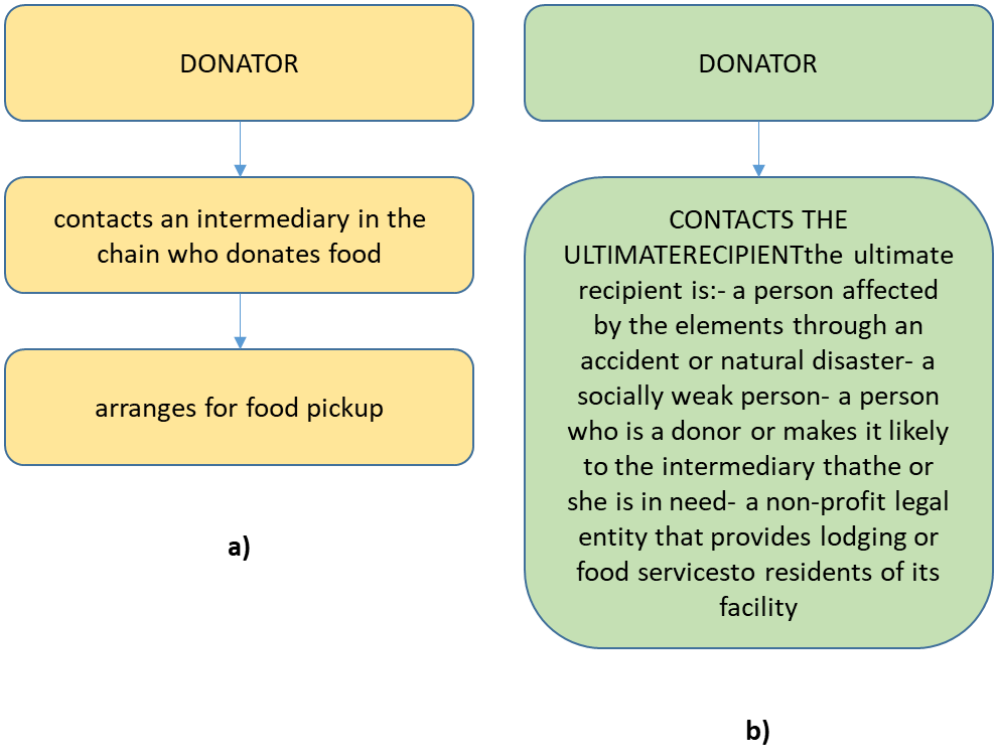


Figure 3. Schematic representation of food donation **a)** through intermediaries in the food donation chain, **b)** directly to the end consumer

Critical factors for quality management in non-profits that distribute surplus food are:

- **Establishing Food Safety Protocols**

Protocols for food safety must be designed and implemented in line with applicable rules and recommendations. This includes ensuring that excess food is appropriately handled, stored, and transported to avoid contamination and assure food safety.

- **Conducting Supplier Evaluation**

Supplier evaluation entails assessing and selecting surplus food producers and donors based on their adherence to food safety standards, quality assurance processes, and regulatory compliance. It is critical to evaluate their performance to assure continuing compliance.

- **Implement Quality Control Checks**

Establishing processes for quality control checks on received surplus food may involve visual inspections, temperature monitoring, and sensory assessments to identify any signs of spoilage, contamination, or quality issues.

- **Prioritize Proper Storage and Handling**

Proper food storage and handling are required to avoid food damage or decomposition. To maintain the quality and safety of surplus food, appropriate storage

facilities, and equipment must be provided, as well as ensuring that food items are stored at the proper temperature, properly organized, and protected from pests, cross-contamination, and other factors that may compromise their quality.

- **Monitor Shelf Life and Expiration Dates**

Regularly monitoring and managing the shelf life and expiration dates of surplus food items is crucial. Distribution should be prioritized based on the remaining shelf life to ensure recipients receive food that is still within the acceptable consumption period.

- **Develop Standard Operating Procedures (SOPs)**

It is important to create standard operating procedures (SOPs) for various aspects of surplus food distribution, including receiving, sorting, storing, and distributing food items. SOPs may help maintain consistency and provide guidance for volunteers and staff involved in the distribution process.

- **Training and Educating Staff and Volunteers**

Providing comprehensive food safety, quality management, and proper handling procedures training to staff and volunteers may assist ensure that everyone involved in the distribution process understands their roles, responsibilities, and best practices. It is advisable to designate an employee in the company who is responsible for food donations.

- **Maintaining Documentation and Traceability**

It is important to keep detailed records of surplus food transactions, including donor information, quantity received, distribution dates, and recipient information. This documentation allows for traceability and gives a procedure for dealing with any potential problems or recalls. The format of documents (delivery bills) that should accompany food is not prescribed. However, it is recommended to indicate basic information such as the type, name and quantity of food.

- **Recipient Feedback**

Mechanisms are required to be put in place to collect feedback from recipients on the quality and suitability of the leftover food supplied. This input assists in identifying areas for improvement and ensuring that the cuisine matches the receivers' needs and preferences. Who is responsible for the donated food? The food donor is responsible for food safety until the food is collected by an intermediary in the food donation chain or, in the case of direct donation, by the final recipient. An intermediary in the food donation chain is responsible for food safety from the time the food is picked up from the food donor until the food is distributed to the final recipient.

2.2.3 Logistical support requirements for food donation, collection, and distribution – refers to Food Suppliers and Charity Organisations



To guarantee that surplus food reaches those who need it most, efficient food donation, collecting, and distribution procedures, together with suitable storage and monitoring mechanisms, are essential. By following the stated guidelines in the ReS-Food framework, companies/organizations could provide a significant impact in reducing food waste and decreasing food losses in their communities. Furthermore, the proposed methodological Framework could help the companies/organizations to understand what is essential to be provided in logistical support for food collection from food donators in the EU and that all the conducted activities are compliant with regulations, promote food safety, and effectively address the needs of individuals and communities facing food insecurity.

Guidelines for successful logistical implementation of food donation, collection, and distribution:

2.2.3.1 Legal aspects – refers to Food Suppliers and Charity Organisations

The first step involves ***legal aspects*** of food donation, collection, and distribution. A thorough understanding of relevant national and EU regulations&guidelines related to food donation, collection, transportation, storage, and distribution is of crucial importance for the start of corresponding activities. Specific regulations could cover different sectors of interest such as EU food safety and hygiene standards, waste management regulations, and relevant donation procedures.

When giving or receiving food for the needy, food donors and food recovery organizations should be **aware of the legal aspects** and **implications of their actions**. The regulation of food donation in the EU is complex and involves various laws that **donors, intermediaries, and policymakers** should examine and consult with legal experts if needed.

One of the main hurdles to donating surplus food in many European countries is the **lack of clear and accessible guidance** on how to ensure food safety for donated products. All food donations must be safe to eat and **comply with relevant food safety laws and regulations**. However, as our research also showed, potential donors often face uncertainty about what food safety rules apply to donated food, as opposed to purchased food, and what steps are required to safely donate food by applicable regulations, resulting in safe, surplus food that could benefit people in need being wasted in landfills.

The General Food Law Regulation - adopted in 2002 as Regulation (EC) No 178/2002 - sets out the **general legal obligations** and **requirements** for **food safety** in the **Member States**. It also sets out the criteria for determining whether a food is "unsafe" or not, requires traceability, and places the responsibility for compliance with food safety regulations on operators. In January 2006 the EU implemented a new set of food safety regulations.

However, until recently, EU policies have not addressed food safety **regarding food donations**. This has changed since the adoption of the EU guidelines. The guidelines clarify which EU regulations are relevant to food donation (including food safety regulations), **help providers and recipients of surplus food to meet the relevant requirements** set out in the EU regulatory framework, and promote consistent interpretation by Member State regulators of EU rules applicable to the redistribution of surplus food.

More specifically, the Commission Communication (2017)/C 361/01 was published by the European Commission in 2017 to provide guidance on food donations and to explain how EU legislation applies to different scenarios of food redistribution. The aim was to **address some of the barriers that prevent food from being donated** within the existing legal framework. The guidance is not binding and does not replace the national guidelines that the Member States may adopt. The flowchart below shows the main steps of food donation.

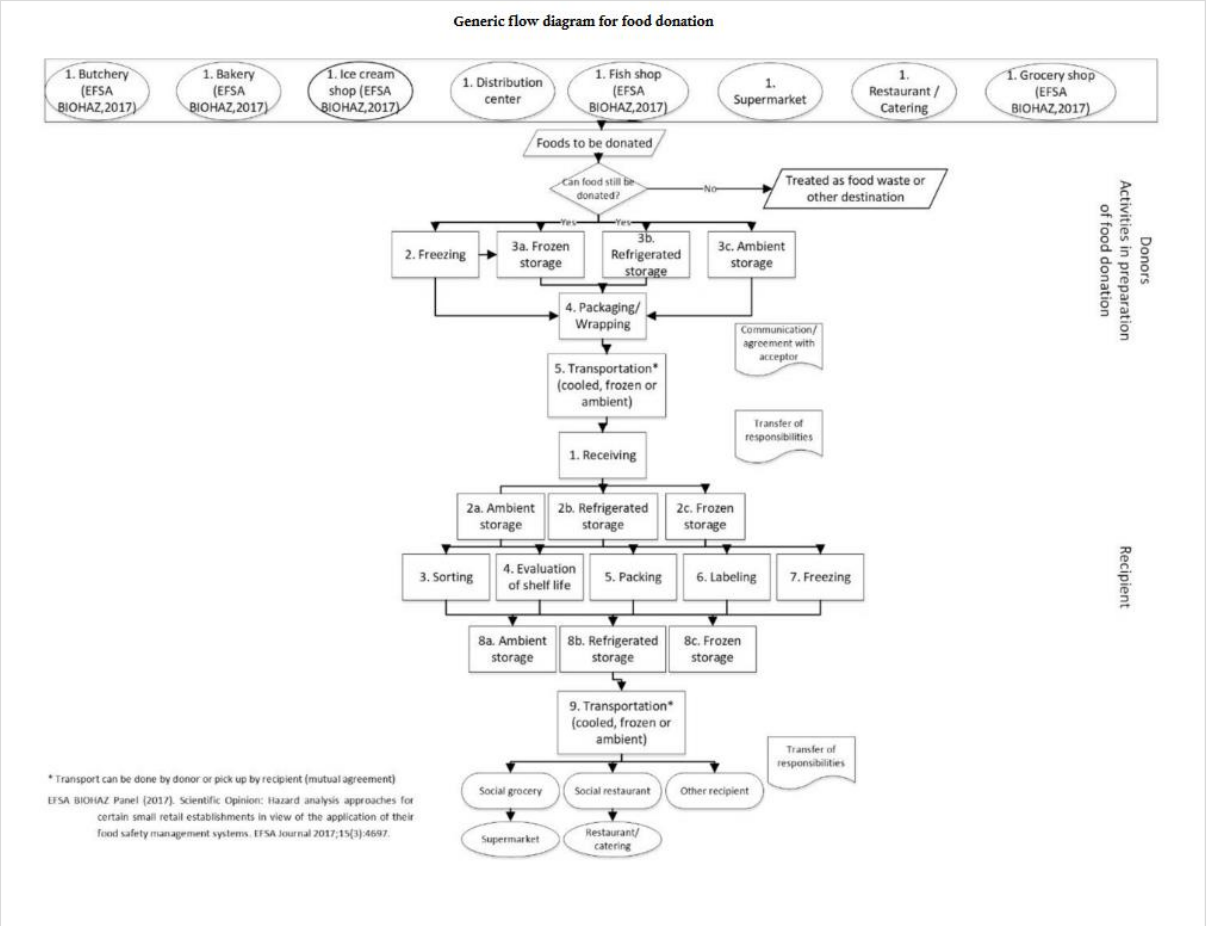


Figure 4. Generic flow diagram for food donation (European Commission, 2020)

The EU guidelines on food donation state that the specific rules that apply to an organization that redistributes food (redistribution organizations and charities) depend on the nature of its activity under the EU legal framework on food safety and consumer information on food. For example, the rules may vary depending on whether an organization donates food to another organization (e.g. a distribution center) or directly to a final recipient (e.g. a supermarket), and on what kind of activity it performs (e.g. preparing meals, such as a social restaurant). Therefore, the flow charts for distribution centers, supermarkets, and/or social restaurants may also be relevant for organizations involved in food donation.

The EU Guidelines explain that EU food hygiene rules **apply to all food operators who are involved in any activity that redistributes surplus food**. They also explain that food redistribution organizations and charities are "food business operators" under the General Food Law and **must follow the General Food Law and other EU food safety rules, including the Hygiene Package**.

Since the EU Guidelines were adopted, some changes have been made to the EU food hygiene rules to make it easier to redistribute more food. For example, Commission Regulation 2021/382 clarifies how to use "use by" and "best before" dates, especially when donating food. The food donation guidelines on hygiene should be read together with these changes. The EU guidelines set out the food safety

obligations that apply to all businesses involved in food redistribution. The EU guidelines also explain the cases in which Member States may derogate from certain food safety rules. The regulations have legal force, but the guidelines do not.

In addition to the EU guidelines, Food redistribution can be subject to national laws that deal with food safety. Some countries, such as France, Estonia, Croatia, Italy, and Slovenia, have included hygiene standards for food redistribution in their national laws, either as part of food safety laws or as separate food redistribution laws.

In other countries, where there is no specific national legislation for food donation, food redistribution operators can benefit from guidelines on hygiene that explain the relevant procedures. For instance, in Bulgaria, the Ministry of Agriculture and Food published a decree on the types of food that can be distributed by food banks. In Spain, although there is no particular legislation on food safety for donations, regional authorities have provided useful guides on best food safety practices for food redistribution. In 2017 the Czech Federation of Food Banks and the Czech Confederation of Trade and Tourism issued internal guidelines on food donation. Similarly, the Finnish Food Authority published a guide entitled "Food donated for food aid", while the Federal Ministry of Food and Agriculture of Germany published a "Guide for food donation to social welfare organizations - legal aspects" to guide the legal framework for food redistribution in Germany.

The **second step** for successful logistical implementation of food donation, collection, and distribution would be the development of comprehensive ***Standard Operating Procedures*** (SOPs) by aligning with national and EU regulations for each stage of the food collection process, including donation acceptance, transportation, storage, and distribution.

A standard operating procedure (SOP) is a document that provides clear and detailed instructions for performing a specific task or operation consistently and efficiently. SOPs are important for ensuring uniformity, reducing miscommunication, complying with regulations, and enhancing productivity and safety. To create an effective SOP, one should follow these steps:

- Define the purpose, scope, and target audience of the SOP,
- Identify the key steps and sub-steps involved in the process,
- Write clear and concise instructions for each step, using simple language and active voice,
- Include any relevant information, such as diagrams, charts, checklists, or templates,
- Review and test the SOP for accuracy, completeness, and clarity,
- Train the staff on how to use the SOP and provide feedback mechanisms,

- Implement the SOP and monitor its performance and outcomes,
- Update the SOP regularly to reflect any changes or improvements (Oragui, 2023).

Adequate SOPs should address food safety, handling procedures, food temperature control, food traceability, and specific documentation requirements. Strict implementation of prepared SOPs in terms of food safety practices, by national and EU regulations is guaranteed through hygiene controls, HACCP principles, traceability systems, allergen management, and proper handling techniques to prevent foodborne illnesses and ensures the most important aspect – complete ***safety of donated food.***

Concerning food redistribution and donation, food donation SOPs should ensure that managers select food items that are safe, nutritious, and suitable for the intended recipients, as well as compliant with the relevant regulations and standards. Work instructions or standard operation procedures should be clear, accurate and simple, visible, or easily accessible. Posters or signs placed strategically can substantially contribute to the awareness and application of correct food handling and donation practices.

At the link below you can access a standard operating procedures manual for a fixed food facility (SOP example), which contains the general standard operating procedures for food safety during storage, handling, and preparation of food. This example can potentially serve as an aid in developing comprehensive standard operating procedures (SOPs) aligned with national and European regulations for each stage of the food collection process, including donation acceptance, transport, storage, and distribution. A SOP template is also available.

Available Material:

Standard Operating Procedure Example

Standard Operating Procedure Template

2.2.3.2 Target area and groups – refers to Charity Organisations

Identification of the target population and geographical area where food collection and distribution will take place is important to meet the specific needs of the community and maximize the impact of implemented methodological framework. Logistical support such as ***transportation, storage, packaging, and labeling*** of the donated food could only be adequately planned after thorough evaluation. When evaluating geographical areas for food donation, collection, and distribution, take into account elements including accessibility, quantities, proximity to food sources, and the availability of storage and distribution facilities. The ReS-Food methodological framework will provide templates for the assessment of the abovementioned criteria for Food Donators and Food Distributors.

At this point, five general strategies are highlighted for creating and measuring the impact of a successful charity project (including a food charity project). These strategies are: 1) clearly defining the goals and objectives of the project, such **as target population**, outcomes, and timelines; 2) developing a comprehensive project plan that describes activities, resources, timelines, and deliverables; 3) involving stakeholders and partners in project design and implementation; 4) monitoring and evaluating the progress and impact of the project using appropriate indicators and metrics; and 5) communicating and reporting on the impact of the project on stakeholders, donors and the wider community.

Undoubtedly, defining the target population and the geographical area where food collection and distribution will take place is a key strategy in the activities of a charity project. Food charities in particular are front-line non-profit organisations that provide food assistance to **people facing food insecurity or hunger**. They target **different populations** and **geographical areas** depending on their **mission, vision, and available financial resources**. Some food charities focus primarily on serving specific groups of people, such as children, the elderly, refugees, the homeless, low-income people, or people with disabilities. Charities are also affected by the heterogeneity of the target population. Some recent studies show that charities can provide partially integrated products or services to the target population when the needs of the population are highly heterogeneous.

There are many different ways of redistributing surplus food within the EU, but they can be broadly grouped into two categories: **'back-line'** and **'front-line'** organizations (Figure 5). Some organizations may combine elements of both categories:

- Back-line organizations act as a bridge between the food supply chain and 'front-line' organizations. They collect donated food from various sources, following the rules and regulations for food hygiene, safety, and consumer information. They then distribute it for free or at a low cost to a network of partner charities that are qualified and registered. Volunteers sort the food products by checking their dates and quality and packing them for distribution.

- Front-line organizations have direct contact with people who need food assistance, and they may also collect donated food from different sources, following the same rules and regulations as 'back-line' organizations. They provide donated food to people who need it through various programs. These organizations may offer food that can be cooked at home (e.g. pasta, vegetables, canned food, etc.) or food that is ready to eat / prepared meals. Examples include:

  - Making food parcels;
  - Making meals (e.g. soup kitchens, shelters, social restaurants/cafes);
  - Selling food products to people who need them at a reduced price

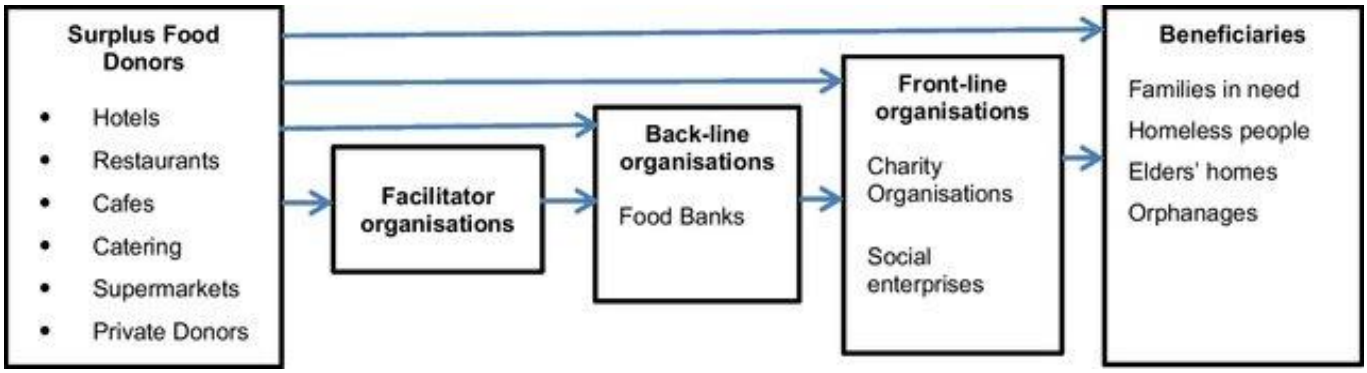


Figure 5. Flow-of-surplus-food-redistribution (Source: ResearchGate)

Food charities often use different methods to provide food assistance, such as food banks, food pantries, soup kitchens, meal programs, etc. In addition, successful and adequate funding is also very important. A common problem faced by such initiatives is the inability to secure funding. Charities can also work with external agencies to make their initiatives feasible or to overcome the insecurity of their funding. For example, humanitarian organizations trying to alleviate hunger often rely on the private sector to supply food. However, some charities are reluctant to partner and share resources with other humanitarian organizations because this may reduce media attention and future donations from individual donors.

The targeting and eligibility criteria are based on various indicators that show the extent and impact of a crisis on different groups of people. The criteria guide the design and purpose of the Food Distribution, ensure that food assistance is needs-based and avoid any negative impacts of food assistance. Targeting is mainly done to optimize the use of resources. The targeting process should be less costly (in terms of time, staff, food, and money) than providing food to all.

To justify targeting, there should be clear and observable differences between targeted and non-targeted individuals. Eligibility criteria should define the characteristics of these people and should be realistic and transparent. All food aid is geographically targeted, which means that food is given to some areas and not others. This can happen at different scales: between countries, regions, sub-regions, zones, districts, or villages. Targeting within geographical areas is appropriate when:

1. There are marked differences in needs between target and non-target groups

2. The target group is a minority with distinct needs

3. It is possible to carry out a targeted distribution

4. The community supports the targeting strategy

The main methods for targeting are administrative targeting and community-based targeting. Administrative targeting involves government and humanitarian agencies using registration systems. Community-based targeting depends on a community-elected committee that decides the eligibility criteria.

Food security, food transfers standards

- Food security, food transfers standard 1: General nutrition requirements. Ensure the nutritional needs of the people in need.
- Food security, food transfers standard 2: Appropriateness and acceptability. The food items provided are appropriate and acceptable to recipients so that they can be used efficiently and effectively at the household level.
- Food security, food transfers standard 3: Food quality and safety Food distributed is fit for human consumption and of appropriate quality.
- Food security, food transfers standard 4: Supply chain management. Commodities and associated costs are well-managed using impartial, transparent, and responsive systems.
- Food security, food transfers standard 5: Targeting and distribution. The method of targeted food distribution is responsive, timely, transparent, safe, supports dignity, and appropriate to local conditions.
- Food security, food transfers standard 6: Food use. Food is stored, prepared, and consumed safely and appropriately.

2.2.3.3 Networking – refers to Food Suppliers and Charity Organisations

Establishing a strong redistribution network of partners and collaborators represents a fundamental step in achieving sustainable and long-lasting food rescue initiative and represent a precursor for the successful practical implementation of food donation, collection, and distribution (Figure 6).

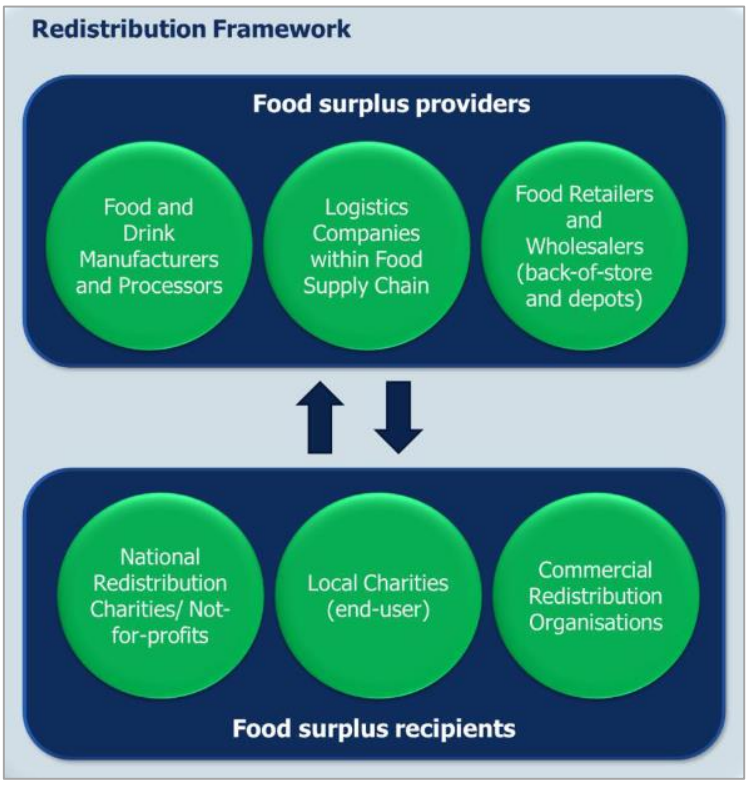


Figure 6. Redistribution Framework (Source: WRAP)

However, for effective redistribution partnerships, partnerships should be formalized through specific ***partnership agreements*** (Figure 7)**.** Different partnership agreements should be established with food donators, such as restaurants, grocery stores, and food manufacturers, to secure regular donations and different with local community organizations, food banks, and NGOs to ensure effective food collection and distribution If possible, legal support from government agencies, corporate sponsors, and volunteers is recommended to enhance logistical capabilities. Through the specific partnership agreements, a clear understanding of quality acceptance criteria, logistics, and any specific requirements for donated food should be determined and specified.

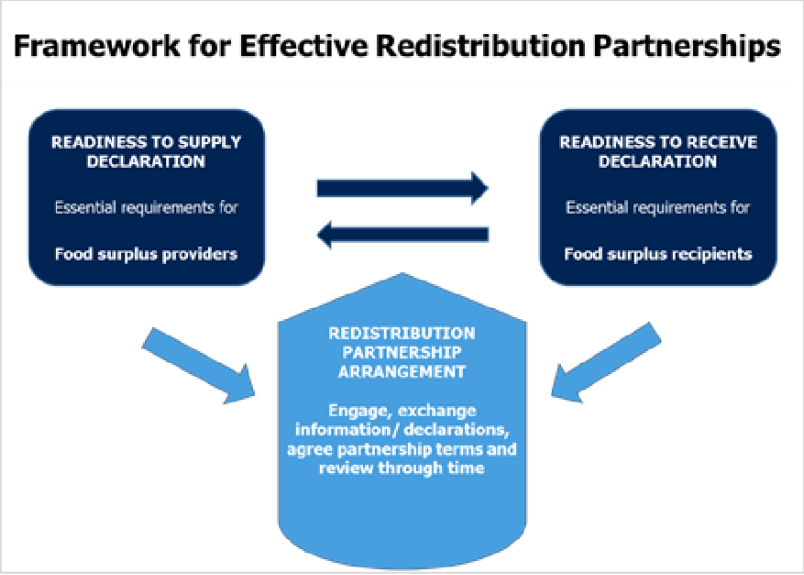


Figure 7. Framework for Effective Redistribution Partnership (Source: WRAP)

Available Material:

Checklist - Selecting your redistribution partner(s)

Readiness to Receive Declaration Template: For Food Surplus Recipients

Readiness to Supply Declaration Template: For Food Surplus Providers

Redistribution Partnership Arrangement Template

2.2.3.4 Food Donation and Collection – refers to Food Suppliers and Charity Organisations

Food collection could be divided into two platforms depending on the partner's role:

- Food donation platform
- Food collection platform

Food donation guidelines

Guidelines and training for food donators regarding acceptable food items, packaging, and labeling requirements must be provided. ***Major Guidelines*** are provided in this Framework, however, specific guidelines are to be determined depending on the community practices and established donation principles.

❖ **Major Guidelines for Food Donation**



- Make sure you are familiar with any ***rules or laws*** in your community regarding food contributions. Different regions may have specific requirements, therefore, it is important to understand any legal obligations and best practices in your area,
- Communicate with Food Collectors, such as food banks, NGOs, or community centers, to understand their specific needs and requirements. Communication is extremely valuable to ensure that your donations ***align with current needs*** and that donations can be effectively distributed to those in need,
- Coordinate donations with the Food Collectors to arrange pick-up or delivery of the donated food. ***Respect schedules*** and follow prearranged guidelines for collection point locations and pick-up times. Clear instructions and contact information for smooth coordination should be provided on time,
- ***Select only food items that are safe***, wholesome, and of good quality. Avoid donating food that is far behind the expiration date or damaged. Never donate spoiled food. Fresh fruits and vegetables, canned food, non-perishable items, and unopened packaged foods are generally preferred. Furthermore, prioritize donating nutritious foods that offer a balance of essential nutrients. Include a

variety of food groups, such as proteins, carbohydrates (grains, fruits, vegetables), and fat-containing products (e.g. dairy products).

- Take dietary restrictions and common food allergies into consideration. ***Label food donations clearly***, indicating the presence of any common allergens, such as nuts, dairy, gluten, or shellfish. This guarantees that recipients can make responsible choices and lower the potential risks of developing serious health issues.

- ***Packaging*** of donated food represents a ***huge logistical challenge*** and requires innovative solutions for maintaining food freshness and integrity. Also, perishable items must be refrigerated or kept at the appropriate temperature during transportation, hence proper packaging helps to prevent microbial contamination and extends the shelf life of the donated food.

- Follow predetermined good hygiene practices during food handling and transportation to the collection points. ***Use only clean containers*** and utensils! Avoid food cross-contamination (allergens, microbes) by keeping different food items separate.

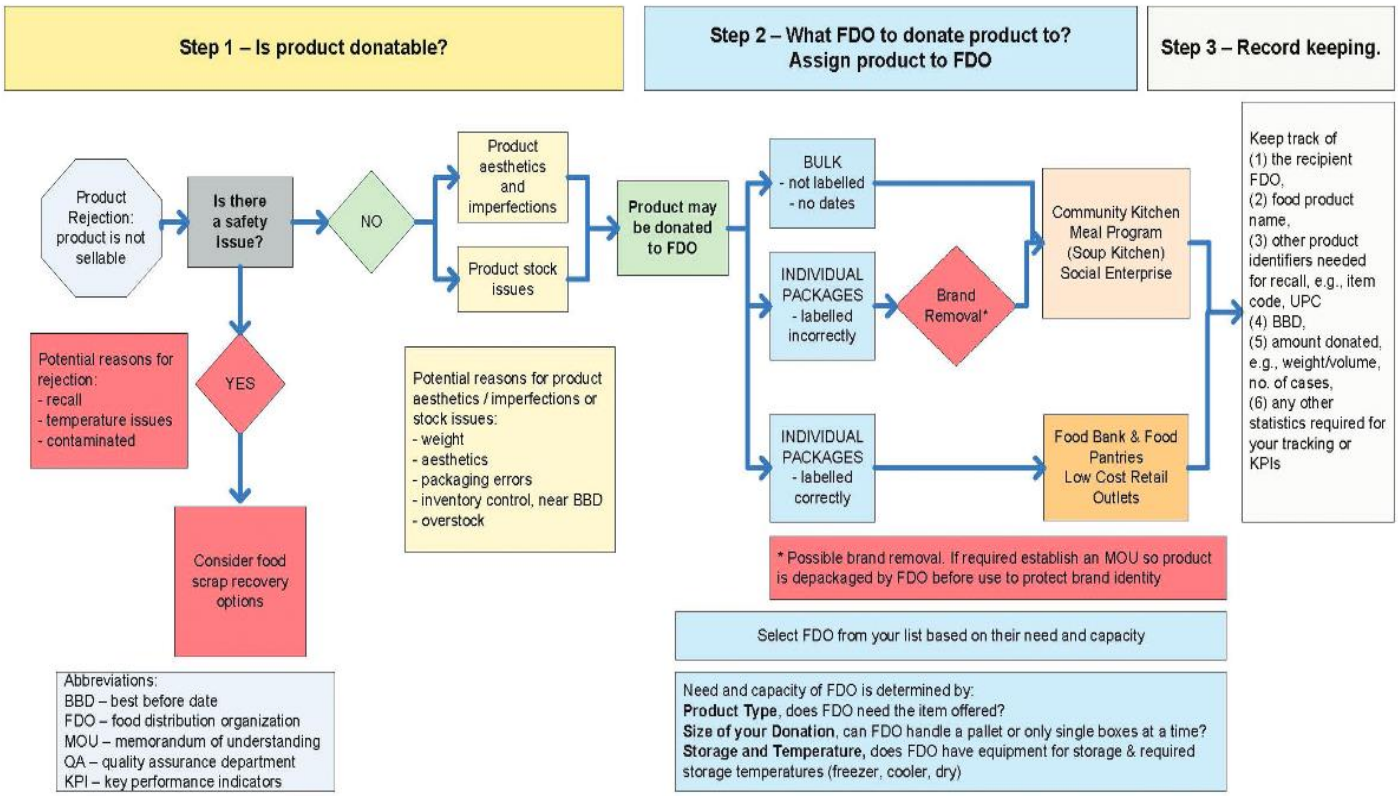


Figure 8. Industry Food Donation Guidelines (Source: BCCDC)

❖ **Food collection guidelines**

Implementing proper protocols and maintaining open communication channels with both donors and recipients will help create a streamlined process that maximizes the benefits of food collection efforts. Major Guidelines for ***Food Collectors*** are provided in this Framework, however, specific guidelines are to be determined depending on the community practices and established donation principles.

- Make sure you are familiar with any ***rules or laws*** in your community regarding food contributions. Different regions may have specific requirements, therefore, it is important to understand any legal obligations and best practices in your area,

- Locate prospective food collecting sites, such as restaurants, grocers, caterers, farms, or public gatherings. ***Establish partnerships or agreements*** with relevant sources to collect surplus food regularly or on specific occasions. Communicate expectations to Food Donors regarding the types of accepted food, packaging requirements, and any specific guidelines for donation,

- Discuss and establish a ***regular food collection schedule*** to ensure an efficient and consistent food collection process. Discuss with food donors the most convenient time frames for food collection that align with their regular operations,

- ***Educate Food Donors*** about food safety practices and the importance of donating safe food. Provide Food Donors with clear guidelines on identifying food that is safe for donation. Establish open lines of communication to address any questions or concerns that Food Donors may have. Jointly develop and follow food safety protocols during the collection process. Ensure that food is collected, stored, and transported at proper temperatures to maintain its safety and quality. Use appropriate containers, such as insulated coolers or food-grade storage bins, to prevent contamination and spoilage,

- Regular ***quality controls*** of the collected food are crucial for constant food quality and safety. Always perform visual checks to ensure the freshness of the food, and visually confirm that food is unspoiled and properly packaged. Discard any items that do not meet the required standards to maintain the integrity of the donation,

- Food Collectors should maintain specific ***records of food collection activities***, including dates, Food Donor information, and the types and quantities of food collected. Proper documentation enables you to track the flow of donations, identify trends, and ensure accountability.

- If possible, ***involve and train volunteers*** who will be involved in food collection activities. Volunteers should be trained and prepared to distinguish proper handling, packaging, storage, and transportation techniques. Strongly emphasize food safety practices, including all hygiene practices. Therefore,

trained volunteers with the relevant knowledge and skills will ensure food safety throughout the collection process,

- ***Show appreciation to food contributors*** for their generosity. Recognize Food Donors' generosity through thank-you letters or certificates of appreciation. Building positive relationships with Food Donors encourages ongoing support and fosters a sense of community involvement.

2.2.3.5 Transportation – refers to Charity Organisations

The logistics of transportation in the food donation process involve the planning, coordination, and execution of moving donated food from the donor to the recipient organizations. Evaluation of the most efficient and cost-effective method represents the first step in planning donated food transportation. Several factors should be considered such as the ***quantity and type of food***, ***distance***, ***delivery schedules***, and ***available resources***.



To collect surplus food from different donors, follow these guidelines: Keep the food refrigerated at all times, or limit the travel time to less than 2 hours. Depending on the situation, you can use:

- A vehicle with a fridge, from a small van to a big truck
- A bike from the community
- Walking—for donors nearby
- Delivery by the donor

- Support from a community partner.

Based on the quantity and type of food, specific vehicles must be selected. For example, refrigerated trucks may be necessary for perishable items, while non-perishable food can be transported in standard vehicles. Furthermore, large donators could demand large vehicles to be as cost-effective as possible.

Distance between the collection points, distribution centers, and final users will require rout optimization. To reduce costs and travel time, ***routes must be planned*** carefully. To maximize transportation efficiency, several elements like traffic conditions, delivery locations, and time limitations must be considered.

If possible, a partnership with Delivery Services is more than welcome. Collaboration with local delivery services or courier companies that can provide transportation support for larger donations or when additional resources are required is beneficial.

Documentation and reporting about transportation activities are mandatory for serious Food Donation programs. For future reference, ***complete records of all food donations***, transportation activities, and other pertinent information should be kept for evaluation and dissemination purposes. This facilitates tracking donations, assessing the effectiveness of logistics, and producing reports for stakeholders. Furthermore, regular review and assessment of the transportation logistics process is important to identify areas for improvement. ***Feedback from donors and recipients*** is a good practice to optimize efficiency, reduce waste and costs, and enhance the overall food donation program.

Regarding food transportation from food recipients to those in need, food banks and relevant organizations (Food Distributors) involved in food recovery and redistribution may face various challenges depending on their geographic reach, management objectives, time horizon, and concentration of needs. Also, the **efficiency of food transport** is a key factor for network design problems involving large areas. Food distribution decisions are also influenced by the equity and quality of food reaching the beneficiaries. Demand-side considerations include not only the equity of meeting needs, but also the quantity and quality of food provided by host organizations and distributors, who have limited control over supply, and minimizing spoilage when delivering food to remote organizations. Demand is usually a deterministic parameter that is known. Sometimes, organizations estimate and report their demand to food banks. Other times, the poverty levels of a particular area determine the extent of charitable food operations.

Donations are often irregular and insufficient to meet demand. Therefore, Food Distributors must address the trade-off between being fair (ensuring that every person in need has an equal opportunity to be served) and being effective (serving as many people in need as possible). This is a common problem for nonprofits. The amount of food donations is also often insufficient to meet all needs. Moreover, meeting demand is not only about the quantity provided but also about the nutritional content. Recent studies have taken into account the nutritional needs of individuals to determine

demand or assess the performance of food distribution. Another practical issue is the allocation of available products in packages for distribution. One of the difficult and important tasks of Food Distributors is to divide the heterogeneous supplies they receive.

2.2.3.6 Storage and Warehousing – refers to Food Suppliers and Charity Organisations

The storage and warehousing of donated food play a critical part in a long chain of Food donation activities. Adequate storage of donated food ensures food safety, quality, and hence efficient distribution of food to the final consumers.

In the process of storage and warehousing, the implementation of proper food safety protocols to maintain the quality and integrity of donated food is the biggest logistical challenge. Implementation of proper food safety protocols requires thorough planning and understanding of donated food product requirements. The most relevant practices include ***proper temperature control, maintaining hygiene, first-in-first-out (FIFO) inventory rotation, and adherence to expiration dates.***

To have sustainable processed food storage, specific inventory management is used. Establishing an ***inventory management system*** that tracks donated food items, quantities, and expiration dates will create a solid baseline for easier implementation of food safety protocols. Techniques such as food categorization, labeling, and coding enable accurate tracking and monitoring of selected inventory. Organization of food items in the abovementioned manner will facilitate efficient storage and final retrieval.



The categorization of donated food can vary significantly depending on the company/organization's specific needs and the types of food being donated. A list of the following methods for categorization should be considered and followed:

- Categorization of donated food based on its ***general types***, such as canned goods, dry goods, fresh produce, dairy products, meat and poultry, bakery items, etc. Benefits: easy identification and grouping of similar items.

- Categorization of donated food based on its ***shelf life or expiration dates***. Grouping perishable items that require immediate attention and separating them from non-perishable items. Benefits: prioritize distribution and minimizes waste.

- Categorize food items based on their ***nutritional value*** or dietary specifications, such as non-perishable items suitable for individuals with specific dietary needs (e.g., gluten-free, sugar-free, or low-sodium products). Benefits: address the specific requirements of final consumers.

- Categorize food items based on ***allergens content***. Identification of food items that contain common allergens, such as nuts, soy, dairy, or gluten is of high importance for the safe food donation principle. Benefits: prevent cross-contamination and accommodate individuals with allergies.

- Categorize food based on its ***packaging type***, such as canned, boxed, bagged, or bottled products since different packaging types may require different handling or shelving methods. Benefits: efficient storage and retrieval.

- Categorize food items based on ***weight or quantity***., especially when dealing with large quantities of donated food. Benefits: managing inventory and planning distribution

- Categorize food items based on the ***food groups*** they belong to, such as fruits, vegetables, grains, proteins, or dairy products. Solid Food Donation programs provide a balanced and diverse range of food options to the final recipients. Benefits: tailoring final consumer needs,

- Categorize food items based on their ***donation sources***, such as restaurants, grocery stores, food manufacturers, or community donations. Benefits: acknowledge contributions from different sources and establish partnerships with regular donors.

- Categorize food items based on ***preparation methods***: ready-to-eat items or ingredients. Some food items can be directly distributed to individuals without further preparation separately from those that require cooking or additional ingredients. Benefits: better efficiency and usage of donated food.

Required for the sorting, storage, and distribution of perishable food received:

- Bins, totes, boxes, and containers for collection and distribution to agencies, farmers, or for recycling/composting. Consider carefully the filled weight for bins, donor requirements, storage capacity restrictions, colors for easy sorting, etc.
- Method to wash/sanitize bins, tables and work area, water supply, hoses, bleach
- Weight Scale—bath scales, pallet scale, floor scale, commercial industrial scale
- Sorting tables—may be folding, easy to clean, standing height, plastic or stainless steel
- Markers to mark off bar codes
- Refrigerated/ Freezer storage
- Method to move food—Volunteers, dolly, pallet jack, pallets, forklift
- Method to track—clipboard, computer, spreadsheet, Google Forms.

Labeling methodology for donated food typically involves ***clear and informative labeling practices*** to ensure transparency, food safety, and appropriate handling. It's important to note that specific labeling requirements may vary depending on local regulations and the policies of the receiving organizations. Some of the most important information that should be labeled include the product name and description, ingredients and allergens, nutritional information (if available), expiration or best-before date, food safety warning, and storage and handling instructions. It's advisable to consult with the intended recipient or local food safety authorities to ensure compliance with any specific guidelines or restrictions.

A common cause of food waste and a barrier to food donation is the misunderstanding of date labels on food. Many food donors and food recovery organizations are unsure how to determine the safety standards for different types of food. For fresh produce, such as fruits and vegetables, it is easy to see when they are spoiled and unsafe to eat, but for packaged foods, it is more difficult to tell. Many donors believe that the date labels on these foods are safety-related and throw the food away after the date has passed. Intermediaries may also discard donated food after that date, believing the food is not fit for human consumption.

However, this is a misconception because most of the date labels on food relate to the freshness or quality, not the safety of the food. The EU guidelines explain that while foods that have passed the 'best before' date may pose safety risks, foods that have passed the 'best before' date are still safe to eat 'as long as the storage conditions are

observed and the packaging has not been damaged. ". The guidelines also state that when donating food with an expiration date, the donor must "ensure that there is sufficient shelf life when delivering these products to organizations to allow for their safe distribution and use by the end consumer before the stated expiration date."

Although EU rules allow the redistribution of products after the expiry date and most Member States agree, some Member States still do not allow the donation of food after the expiry date, such as Bulgaria, Croatia, Cyprus, Hungary, Bulgaria, Croatia, Cyprus, Poland, and Romania. However, most EU Member States have requirements for donation in line with EU recommendations on the possibility of redistribution after the 'best before date.

Depending on the quantity or requirements of donated food items, a specific **storage facility** should be selected. Storage facilities should have appropriate shelving and storage equipment, Furthermore, maintain a clean and sanitary storage environment through regular cleaning and disinfestation of storage areas, shelving units, and equipment to prevent the growth of bacteria, pests, and other contaminants. Established cleaning and sanitation procedures should be followed.

When working with perishable foods, proper temperature control methods are mandatory. Temperature data should be monitored and recorded regularly to ensure that the storage environment is within acceptable limits. Using refrigerated units, freezers, or temperature monitoring systems may be necessary.

Implementation of security measures to protect donated food from theft or unauthorized access is also important. Security measures could include restricted access to storage areas, video surveillance, and inventory control procedures to prevent losses.

Continuous communication with food donators is mandatory to follow and provide all the requirements regarding the storage and handling of donated food items. Safe handling of donated food through the implementation of proper food safety protocols maintains the quality and integrity of donated food. Furthermore, the best available practices such as first-in-first-out (FIFO) inventory rotation are highly recommended.

Regular monitoring, maintenance, and documentation are essential for the effective storage and warehousing of donated food. By implementing proper storage practices, organizations can ensure that donated food remains safe, of high quality, and readily available for distribution to individuals and communities in need.

In 2020, WRAP, a UK-based organization that works on sustainability, published an updated article, which summarises WRAP's research on surplus and waste food in the UK and how it can be safely and legally redistributed to people in need. The article guides how to label and store surplus food for redistribution, to ensure food safety and quality. The article among other things, also covers the legal requirements and responsibilities of food businesses and redistribution organizations regarding date labelling. It also includes a checklist that summarises the essential labeling-related

requirements for safely and legally redistributing surplus food and the additional requirements when freezing food to be redistributed.

Available Material:

Redistribution labeling guide

Surplus_food_redistribution_labelling_checklist

Food surplus redistribution - Agreement to supply/receive food past the 'Best Before date

In summary, Food Donation, Collection, and Distribution Operators must complete the following key steps when receiving food donations:



Food Donation, Collection and Distribution Checklist

☐ Ensure that appropriate hygiene and quality standards and practices are in place at the warehouse;

☐ Make clear to the donor organisation any relevant information mandated by' EU Food Information to Consumers legislation along any current national laws;

☐ Consider accepting ambient, chilled, and frozen food, as long as the food has and can be safely stored, transported and delivered and in accordance with existing food hygiene and safety legislation;

☐ Ensure appropriate hygiene and safety standards of vehicles used for deliveries and that they are able to maintain the cold chain;

☐ Ensure that donated food products are used to feed people in need and not for any other purpose;

☐ Ensure full traceability of food products donated;

☐ Reach an agreement with the food and drink manufacturer, retailer and wholesaler on the frequency of consignments;

3. SWOT Analysis for Food Donation, Collection, and Distribution

3.1. Introduction

SWOT is an acronym standing for strengths, weaknesses, opportunities and threats. By doing a SWOT analysis, food donators and charity organizations cannot just assess their current status quo, but can develop future strategies for their business success. With this tool, charity organizations and food donating companies can easily and effectively identify factors that are holding them back, and at the same time, it enables them to see clearly the opportunities they can exploit. Once the analysis is done, and the external and internal factors affecting the food donation business model have been identified, it will be easy to make the right decisions and develop appropriate strategies for enhancing the efficiency of activities related to food rescuing.



3.2. SWOT Analysis for food donators and charity organisations

With the help of this strategic planning tool, **food donators** (restaurants, hotels, cafés, catering companies and supermarkets) can effectively assess their performance, the competition, the risks and the potential of their businesses related to the topic of food rescue and surplus food reduction.

The tool is equally applicable to **charity organizations** on the other side of the food donation chain. They can use the SWOT analysis to gain a deeper understanding of their external environment, their strengths and weaknesses, and also the opportunities arising from food rescuing and from their charity work.

Both for the food donator companies and the charity organizations involved in the food rescue chain, the SWOT analysis is useful, as it:

- gives them a clear understanding of their own strengths and weaknesses;
- helps them with an overall analysis of their own external and internal factors, that will allow them to realign their companies/organizations and make optimal decisions, thus achieve better results;
- helps them mitigate the risks and use their resources in the best possible way;
- helps them develop competitive advantage over their competitors;
- supports the development of appropriate strategies - aimed towards specific goals of the organization, such as implementing the food rescue chain within their organizations in the most effective ways.

When conducting a SWOT analysis, it is highly recommended to involve as many departments as possible, since different people might come up with different ideas. This contributes to a more complex picture, allowing for identifying thus far not noticed opportunities. So diverse groups or voices within the organisation can make the SWOT far more realistic and useful. Having a broad set of perspectives is also more likely to result in more value-adding contributions.

3.3. Step-by-step instructions

3.3.1. Assessment of strengths and weaknesses (internal factors)

Strengths and weaknesses are those internal factors that a company or organisation can have influence on, these are the factors that are within the control of the company/organisation.

Strengths

In the first step of the SWOT analysis, food donating companies/ charity organisations should list their strengths. When listing strengths, the following things may be taken into consideration: the things that the organisation does outstandingly well, the high quality of products, highly qualified workforce, unique selling proposition, financial resources, etc.



When a Ho.Re.Ca company or charity organisation is working on identifying its strengths, it is worth raising the following questions:

- What are we particularly good at when it comes to food rescuing/delivering food to those in need?
- In what ways are we better than others concerning food rescuing/food delivering to those in need?

- What are the specific knowledge/skills areas that we possess related to the food rescue chain?
- What are the assets or resources that we do possess and our competitors don't?
- What are the things our team values the most about food rescuing/delivering food to needy people?
- etc.

Weaknesses

The second step is to list the weaknesses. When identifying the weaknesses, food donating companies / charity organisations should think of anything that is preventing them to manage the food rescue chain more effectively of efficiently. These can be: their internal business procedures, human and time resources, their position compared to their competitors' position, shortcomings in expertise and know-how, limited financial resources, etc.



When a Ho.Re.Ca company or charity organization aims at identifying its weaknesses, the following questions might be very useful:

- Which are those internal processes or structures that could be improved so as to increase our efficiency when it comes to food rescue/delivering surplus food as charity?
- What are the things other charities/restaurants/cafes/hotels/supermarkets are doing better than us when it comes to food rescuing/delivering of surplus food to those in need?
- Are there any knowledge or skill areas in which our team is not adequately trained?

- Are there any resources that our company/organisation does not possess but would be needed for a more efficient food rescuing activity?

- etc.

Once the strengths and weaknesses are listed, they should be ranked based on their importance or priority. When the ranking is ready, the first 5 strengths and the first 5 weaknesses should be inserted into the SWOT table. Working with more strengths and weaknesses might not be that efficient, so it is perfectly optimal to work with 5-5 aspects from each category.

3.3.2. Assessment of opportunities and threats (external factors)

As mentioned above, ***the opportunities and threats*** are ***factors coming from the external environment***, thus they cannot be influenced by the organisation itself. What the charity organisation/Ho.Re.Ca. company can do, is to react in an appropriate way to these uncontrollable developments of the environment.

The external factors can be perceived either as threats or opportunities, depending on the exact situation. For example: a political circumstance can be making new funds available for businesses for reducing food waste – this is an opportunity. On the other hand, increasing taxes is also a political circumstance, which is a threat/risk for the company.

Opportunities

Opportunities are factors that are external to the company or organisation that might arise from for example the market a company/organisation is serving, or from the technology it is using. One should look for opportunities in a conscious manner, not neglecting the following aspects: sociocultural changes in the attitude of the target groups, market- and other trends, legal and political circumstances, etc.



So when trying to identify opportunities, Ho.Re.Ca companies/charities that wish to take active part in the food rescue chain should focus on questions such as the following:

- What legal or political developments/regulations are offering advantages to those involved in the food rescue chain and how can we exploit them for our benefit?

- How can we take advantage of our target groups' increased interest in reducing food waste?
- What trends can we examine in connection with food rescue and how can we turn them to our advantage?
- What partners should we identify to build useful synergies with alongside the food rescue chain?
- Are there any external funding opportunities or other incentives, which can support our food rescuing ambitions and activities?
- How can we turn our strengths into opportunities?
- etc.

Threats



Once the opportunities have been identified, the very same way, threats should be listed. Threats, just like opportunities, are external factors, which the company/organisation cannot have influence on. This can be anything that is negatively affecting our food rescue/surplus food delivery activities from the outside, such as: inflation, new competitors, changes in the price dynamics, changes in legislations, etc.

For Ho.Re.Ca companies/charity organisations making their SWOT analysis focusing on the food rescue chain, the following questions might be very useful to observe:

- What legal laws or regulations can have negative impact on our food rescue activities?
- What external factors can jeopardize our food rescuing goals/surplus food delivering goals?
- What are the market- or other trends that might be a risk for our food rescuing activities?
- Are there changing quality standards negatively affecting your activities related to food rescuing/surplus food delivering?
- etc.

Similarly as in case of strengths and weaknesses, when it comes to threats and opportunities, also 5-5 should be selected from each category, ranked based on their importance and priority, and then written into the respective grid of the SWOT table.

3.3. Practical Examples – "Food for thought"

Hereby, we are presenting two scenarios of SWOT analysis, the first one offering food for thought for Ho.Re.Ca. companies/supermarkets when doing their SWOT analysis, whereas the second example does the same, but from the perspective of a charity organisation. Although the two examples are made for illustrating possible SWOT scenarios, both examples are heavily relying on the answers gathered during the conduction of the Europe-wide Assessment Analysis and through the Environmental and/or Food Security Experts' Interviews Analysis within the framework of our ReS-Food project.



Example 1 – Food donators' potential external and internal factors to keep in mind and observe

As a first example, we will look at a Ho.Re.Ca. company/organisation that aims to eliminate food waste, start donating surplus food and ensure food distribution. The listed strengths, weaknesses, threats and opportunities are aiming to present possible factors for each category – strengths, weaknesses, opportunities and threats of the SWOT analysis.

Strengths (5)	Weaknesses (5)
▪ commitment of the management to reduce food waste ▪ high motivation and support of the employees to join the food rescue chain ▪ ability to actively contribute to humanitarian goals ▪ staff experience and know-how ▪ excellent communication with existing target groups	▪ lack of adequate storage space for surplus food ▪ extra administrative burden connected to food donation – need for more working hours ▪ no existing connections with charity organisations ▪ lack of time for transporting the surplus food ▪ unpredictable amount of surplus food
Opportunities (5)	**Threats (Risks) (5)**
▪ tax deduction for donor companies ▪ eliminated/reduced costs of transporting surplus food (charities taking it away) ▪ behaviour change and awareness of the wider community ▪ new external funding opportunities for supporting the implementation of food rescue initiatives ▪ build new partnerships (volunteers, charities, transport companies, etc.)	▪ changes in food safety regulations ▪ unexpected rise in the cost of transportation ▪ inflation and rising food costs ▪ unpredictable changes in the legal and economic environment ▪ lock-down for any reason, such as Covid or war.

Example 2 – Charity/Food recipient organisations' potential external and internal factors to keep in mind and observe

As a second example, we are examining a charity company organisation. The aim of the charity is to receive as much surplus food as possible and to distribute it to its target groups – people in need, big families with limited financial resources, meanwhile ensuring the highest possible quality of the donated food. The charity currently distributes all the donated food and feels that there is need for more food from the side of the target groups, thus it wants to address this need.

Strengths (5)	Weaknesses (5)
▪ high motivation and enthusiasm of the employees to distribute food ▪ ability to act in a socially responsible way, helping those in need, contributing to humanitarian goals ▪ good and continuous connections with volunteers supporting the donation process ▪ good existing relationship with food donator companies ▪ staff skills, experience and know-how	▪ no adequate conditions for storage and warehousing to assure the quality of the surplus food in case of bigger quantities ▪ law number of food donating companies with which there is an existing relationship (could be increased) ▪ weak social media presence ▪ limited financial resources for buying an additional vehicle for transporting the donated food ▪ not being able to collect the food at any time (e.g. in case of surplus food from restaurants, very often surplus food should be collected during the night, for which we have only limited human resources)
Opportunities (5)	**Threats (Risks) (5)**
▪ behaviour change and awareness of the wider community ▪ contributing to humanitarian goals, create goodwill and social responsibility ▪ external funding possibilities for supporting the implementation of food donation initiatives ▪ growing demand (due to inflation and migration) ▪ building new partnerships (with companies from all the supply chain sectors that potentially generate food loss, ▪ transport companies, volunteers, etc.)	▪ changes in food safety regulations ▪ unexpected rise in the cost of transportation ▪ inflation and rising food costs cause less consumption and less wasted food ▪ unpredictable changes in the legal and economic environment ▪ unpredictable amount of surplus food

3.4. From Analysis to Action – Strategy development

As shown above, the process of conducting the SWOT analysis is identical both for food donator and food recipient companies and organisations. Moreover, some of the external opportunities or the threats they are facing concerning the food rescue chain, are very similar, which is providing excellent strategic cooperation possibilities.

Once the analysis is done the next steps are related to strategy development. Strengths and weaknesses should be compared systematically, just as opportunities and threats. The next step is to determine how they relate to each other and how they can be turned into a set of actions with which the company will achieve their goals. Ho.Re.Ca. companies or food recipient organisations can take various strategy development approaches[1]:

- to match their strengths with the opportunities
- to use their strengths to fight against threats
- to eliminate their weaknesses to utilize opportunities
- to not let weaknesses become the target of threats

The result of the SWOT analysis will be the strategies for further actions that the food donator/ food recipient company/organisation have determined ***for each of the four strategic areas***, in particular all those strategies that support the process of food rescuing/donation.

[1] Digital Transformation Tool: https://digital-transformation-tool.eu/training/mod/hvp/view.php?id=43



Since there will be many strategies identified, they should be prioritized based on their relevance, and the most promising ones should be chosen for implementation. When making the selection, it is important to try to quantify the potential benefit it brings to the organisation/company, and also pay due attention to the available resources needed for the implementation of these strategies. It is advisable to arrive to 3-5 strategies to implement in total. It is worth noting, that it is worthwhile to conduct the SWOT analysis from time to time again.

With the help of the SWOT analysis, food donator and food recipient companies will be able to easily create an adapted business model that is perfectly supporting their ambitions related to the food rescue chain.

4. Concluding remarks



In conclusion, food donation plays a vital role in the important task of minimizing food waste and successfully salvaging surplus food resources. As we've shown throughout this document, food donation and rescuing food surplus is an important task with serious ramifications, and organized food donation is an effective way to lessen these effects.

By distributing extra food to those in need, we not only end hunger and ease the burden on landfills, but we also foster a sense of civic duty and community cohesion. It's a win-win strategy that addresses the environmental necessity of waste reduction as well as the moral imperative of feeding those in need.

The efforts of individuals, food businesses, non-profit organizations, and government initiatives play a pivotal role in ensuring the success of food donation programs. Through collaboration and innovation, we can streamline the process of food rescue and distribution, making it more efficient and accessible for all.

In this aim to rescue surplus food and donate it to those who require nourishment, every contribution counts. Whether it's a local food drive, a corporate initiative, or policy changes at a national level, we are all stakeholders in this shared endeavour.

With a small step forward, it is possible to keep food donation at the forefront of our strategies to combat food waste. Stakeholders that work together can foster a future where surplus food finds its way to those in need, where hunger is alleviated, and where our communities thrive on a foundation of compassion and sustainability.

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