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BI Norwegian Business School



How can Matsentralen capture more than 3% of 170 000 tonnes of annual food waste?

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Executive Summary

Food waste poses significant environmental, economic, and social challenges in today's society, including extensive greenhouse gas emissions and food insecurity. Although food waste reduction efforts in Norway have gained momentum, critical gaps remain. This consultancy project, the final paper of the BI Norwegian Business school Executive EMBA programme, aims to address these gaps by focusing on the concrete example of Matsentralen, the leading food redistribution organisation in Norway.

This report examines technological systems, innovations, and structural changes needed to address the challenge of streamlining donation processes and ensuring Matsentralen receives quality surplus products in an efficient manner.

Qualitative research is employed to analyse the issue of food waste and donation, providing in-depth insights while capturing contextual nuances of the subject matter within the Norwegian food sector. Stakeholders' views and challenges related to food donation are recorded and included in the creation of effective strategies to reduce food waste through enhancing donations. Dynamics of the Norwegian food sector are explored, providing actionable insights that resonate with Matsentralen and the broader food industry, contributing to a more sustainable approach to food waste management.

Several solutions to the problem are considered, before four potential solutions are considered in further detail. These solutions are subsequently assessed in terms of feasibility and impact and then ranked.

Findings highlight the urgent need for the food sector in Norway to transition from a voluntary agreement to legally binding frameworks, holding stakeholders accountable for their roles in reducing food waste. By incorporating mandatory due diligence assessments, standardising reporting, strengthening management commitment and simplifying financial incentives, Norway can adopt a more comprehensive and effective approach to meeting its ambitious 2030 targets of reducing food waste by 50%.

Furthermore, enhancing communication about Matsentralen's capacities and implementing advanced technological solutions are important for optimising the overall donation process.

The most significant finding is related to the lack of financial incentives for food donation. Relevant laws are complex and ambiguous, and constitute a significant barrier for food donation. To encourage socially responsible and financially rational practises, relevant tax laws must be clarified and changed in order to further promote food donation. This solution has a broad impact, as it encourages food donations, aligns with proposed legislative changes and enhances cross-sector collaboration.

1 Introduction

1.1 Background

This consultancy project has been an inspiring journey, beginning with an exploration of broad challenges related to food waste. This investigation coincided with the delivery of the Food Waste Report by the Food Waste Committee to the Norwegian Ministers of Climate and Environment and Agriculture and Food in January 2024. The committee also proposed new legislation aimed at halving food waste by 2030. The report was examined immediately upon its release, which further fuelled curiosity and the desire to learn more.

The project group includes three members from the Norwegian food sector, offering valuable industry insights, and one from the Canadian timber industry, providing a diverse perspective. This combination enhances the group's understanding of operational challenges and opportunities, improving the project's quality and relevance.

Key contributors to the report were contacted to gradually refine the problem statement, ultimately leading to a partnership with Matsentralen for the project. The initial meeting with Matsentralen in March 2024 laid the foundation for a fruitful collaboration, with the aim of driving change that will enable Matsentralen to capture a larger share of today's food waste. This partnership opened the door to numerous discussions and interviews with central players in the food industry and related organisations, sparking overwhelming interest in the project. The enthusiasm from those involved has been incredibly energising.

Everyone approached, regardless of their position within their organisation, prioritised their time to engage. This collective willingness vitalised the group, intensifying the commitment to ensuring the thesis would be practically relevant to Matsentralen and the industry as a whole. Contacts often went above and beyond, offering unsolicited insights and introductions to their networks.

Why, then, is the industry so passionate and enthusiastic about reducing food waste? One of the stakeholders remarked, "The findings you have uncovered are alarming. It underscores the necessity of having such a generous industry." But is the industry truly so benevolently inclined? To some extent, yes. However, there are multiple reasons for this enthusiasm and the drive to strengthen the fight against food waste - reasons that extend beyond just financial profitability for companies. Building a strong brand name by showcasing sustainability efforts, which in turn creates customer loyalty, is highly beneficial. Increased sales, driven by an enhanced reputation and growing market share, are key objectives, particularly in the competitive food industry. The fear of missing out on being at the forefront of sustainability is a significant motivator. Nothing captures a corporate leadership's attention quite like the prospect of falling behind competitors (Stoknes, 2020). Thus, there is a combination of doing what is right and doing what is profitable. As one of

the stakeholders stated, "Individual sustainability projects where we take the lead are attractive for our company's communication, enhancing our reputation and brand."

1.2 Matsentralen

Since its establishment in Oslo in 2013, Matsentralen has emerged as a critical force in the battle to reduce food waste and alleviate poverty in Norway. The organisation has swiftly expanded, establishing eight regional centres across Norway, all dedicated to redistributing surplus food effectively to those in need.

Initially organised as a cooperative company, Matsentralen received foundational support from major charitable organisations including the Salvation Army, Blue Cross Norway, and the Church City Mission. It was reorganised into an association in 2015, thereby qualifying as a voluntary organisation with VAT compensation rights, broadening its operational scope and enhancing its effectiveness.

Matsentralen was inspired by the national "ForMat" project (2010-2015), which raised awareness and developed comprehensive strategies to combat food waste throughout Norway (Food Waste Committee, 2023, p. 21). Although ForMat laid the foundational framework, Matsentralen has since developed into a distinct entity with tailored operational goals and strategies beyond the scope of the initial project.

The organisation's operations rely on adaptable logistics that respond to unforeseen food donations and their distributions. Supported by financial backing from commercial entities and public grants, Matsentralen has forged strong partnerships with food donors and charitable organisations. This collaborative approach ensures a systematic flow of surplus food to where it is most needed.

Matsentralen serves a dual purpose: Firstly, they seek to reduce food waste in the sector by rescuing surplus food, and secondly, to distribute this food at no cost to non-profit organisations that aid the disadvantaged. Functioning as a charitable wholesaler of surplus food, Matsentralen plays a pivotal role in the food supply chain.

In 2023, Matsentralen redistributed an impressive 6,083 tonnes of food, equating to approximately 12.2 million meals, a 49% increase from 2021. The network now includes 339 partners who donate food and 564 non-profit organisations who receive it, with these numbers continuing to grow (Rålm, 2024).

Looking forward, Matsentralen is committed to expanding its capacity to manage surplus food efficiently, ensuring that no edible food goes to waste. The organisation is diligently refining its operational systems and exploring more automated solutions to handle the increasing volume and complexity of food redistribution tasks. Despite facing challenges, such as insufficient integration of food donation efforts with donor companies and a need for systematic routines and measurements, Matsentralen is addressing these issues to enhance the effectiveness of its food redistribution efforts.

Given Matsentralen's significant untapped potential in its supply chain and the dedication of its extensive volunteer workforce, the organisation is well-positioned to significantly strengthen its impact, paving the way for even more significant contributions to future food security and environmental sustainability.

1.3 Document structure

This document is organised into five main parts beyond the introduction, providing an understanding of the challenge, the methodology employed and resultant findings, followed by discussion, recommendations and a final conclusion. The challenge details the problem statement and relevant background information. The methodology and analysis section explains the research methods used, including interviews and stakeholder analysis, which form the basis of the findings.

The findings chapter identifies primary barriers and opportunities in the food donation process, leading to the proposed solutions, innovations, and structural changes aimed at enhancing Matsentralen's food redistribution efforts. The discussion and recommendation chapter critically evaluates the findings, and presents practical recommendations for Matsentralen. The conclusion summarises key outcomes of the project and outlines next steps.

For ease of reference, the document includes a list of abbreviations and a list of figures. While the document is intended to be read in sequence, specific sections can be consulted independently based on the reader's interests. Appendices provide additional detailed information for those seeking a deeper understanding of the methodology and data.

2 The Challenge

PROBLEM STATEMENT

Which technological systems, innovation and/or structural changes can help streamline donation processes and ensure the delivery of quality products from producers and wholesalers to Matsentralen to minimise food waste?

There is a need for a food turnaround. How we farm, transport and consume food has a more significant impact on the planetary boundaries than any other factor. The planetary boundaries are environmental limits within which humanity can safely operate, ensuring that the Earth's systems remain stable and resilient. The turnaround needed to stay within these boundaries must involve a fundamental shift in farming practices, our diets and last but not least, the elimination of food waste (Declève-Dixon et al., 2022).

Food waste is widely recognised for its significant negative environmental, economic, and social impacts. Approximately one-third of all food produced globally is either lost or wasted, contributing to 254 million tonnes of CO₂ emitted. Around 16% of total greenhouse gas emissions originates from the EU food system. This waste places an unnecessary burden on limited natural resources, such as land and water (European Commission, 2024) and results in substantial financial losses for households, businesses, and governments. In 2020, the EU's market value of wasted food was estimated at EUR 132 billion, including the costs of lost resources and unnecessary household spending (European Commission, 2023, p. 4). Socially, food waste exacerbates food insecurity and represents missed opportunities to feed those in need. This raises ethical concerns about wasting food that could be redistributed to vulnerable populations on both a utilitarian and a deontological level. From a utilitarian perspective, where the focus is on outcomes justifying the means, food waste is undesirable for society and should be actively countered. From a deontological standpoint, which emphasizes the importance of duty regardless of the outcome, there is a moral obligation to prevent food waste (Chukwuneke & Ezenwugo, 2022).

In Norway, the food sector, the government, and the public are working together to address food waste and make gradual improvements toward sustainable practices. Although efforts are ongoing, challenges remain. This consultancy project seeks to contribute to these efforts by building on the work already underway and utilising insights from the Food Waste Report to address the problem statement.

Before addressing the problem statement in detail, it is important to understand the broader context. Key initiatives such as the European Green Deal, the Norwegian Industry Agreement on food waste reduction, and the work of the Food Waste Committee constitute essential background information for the chosen approach. These topics are explored in the following sections.

2.1 European Green Deal

The European Union (EU) and all of their member states have committed to meeting the Sustainable Development Goal (SDG) 12.3, which states that: “By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses” (One Planet Network, 2024). Norway is a member of the European Economic Area (EEA) and the European Free Trade Association (EFTA). The EEA/EFTA states prepared comments on the strategy in March 2021 with overall support for the intentions of the strategy, and indicated that the EFTA countries wish to work with the EU to promote a more sustainable food system (*Regjeringen.No*, 2023).

The EU has implemented several comprehensive regulatory frameworks to become carbon neutral by 2050, as outlined in the European Green Deal. The Circular Economy Action Plan (CEAP), first adopted in 2015 and later reinforced within the context of the European Green Deal, specifies concrete actions to promote sustainable resource management and reduce food waste. A cornerstone of these efforts is the Farm to Fork strategy launched in 2020,

aiming to make food systems fair, healthy, and environmentally friendly. This strategy will also contribute to implementing the United Nations (UN) SDGs, the Paris Agreement and the objectives under the EU Biodiversity Strategy.

The European Commission proposed a legislative framework for sustainable food systems (FSFS) to accelerate and facilitate the transition to sustainability. Although the proposal was expected to be accepted in the last quarter of 2023, it remains uncertain when it will be tabled (European Commission, 2024). However, the EU Waste Framework Directive (WFD) requires all member states to implement national food waste prevention programs, reduce food waste at every stage of the supply chain, and monitor and report on food waste levels.

Despite these efforts, food waste has not been sufficiently reduced to make significant progress towards SDG target 12.3 (European Commission, 2023, p. 6). To address these issues, the European Commission has proposed amendments to the WFD to align waste management practices more closely with the waste hierarchy, prioritizing waste prevention, reuse and recycling over disposal. The proposal is currently under discussion and evaluation within the European Parliament and the European Council. These discussions will focus on its feasibility, potential impact, and strategies for implementation to shape future policies and actions for managing food waste effectively in the EU. However, it is up to individual countries to devise laws to reach these goals. In Norway, reducing food waste involves voluntary agreements and collaboration between the government, industry and NGOs. The Industry Agreement on Food Waste Reduction aims to halve food waste by 2030, aligning with SDG 12.3. More details on this agreement are discussed below.

2.2 Industry Agreement on Food Waste Reduction

The Industry Agreement on Food Waste Reduction, signed on June 23rd, 2017, is a collaborative initiative in Norway to reduce food waste across the entire food value chain. This agreement was initiated as a joint effort between the Norwegian government and the food sector, involving five key ministries and 12 industry organisations. The critical ministries involved are the Climate and Environment Ministry, Agriculture and Food Ministry, Children and Equality Ministry, Health and Care Services Ministry and Trade and Fisheries Ministry. The industry organisations participating in this initiative include the Grocery Trade's Environmental Forum (DMF), Grocery Supplier Association (DLF), Confederation of Norwegian Enterprise (NHO), NHO Food and Drink, NHO Tourism, NHO Service and Trade, Norwegian Farmers' Union, Norwegian Fishermen's Association, Norwegian Farmers and Smallholders Union, Norwegian Seafood Association, Seafood Norway and Virke (federation of Norwegian enterprises).

The 12 industry organisations are defined as the “food sector” in the agreement. Throughout this document, the definition of the “food sector” will cover the following categories:

- Food industry (companies that produce and/or import food e.g. Bama, Fatland, Q-Meieriene, excluding the seafood industry¹)
- Grocery/convenience/wholesaler (e.g. Rema, Coop, Kiwi, Meny, Narvesen, 7-Eleven, Asko, Rema Distribunal, Coop Distribusjon)
- Food service (restaurants, cafes, private canteens)

The primary goal of the Industry Agreement is to align with the UN SDG 12.3 target, aiming to halve per capita global food waste at the retail and consumer levels, as well as reducing food losses along production and supply chains by 2030. The agreement sets intermediate food waste reduction targets of 15% by 2020 and 30% by 2025, with the ultimate goal of a 50% reduction by 2030. Signatories to the agreement are committed to conducting regular food waste assessments, reporting their findings and implementing measures to reduce waste. Additionally, industry participants are expected to promote food donations as part of their waste reduction efforts (Regjeringen.no, 2021).

The Norwegian government supports these initiatives by developing systems to receive and compile reports, creating national statistics on food waste, supporting awareness campaigns and facilitating the food donation process. These combined efforts of government and industry aim to create a sustainable food system that minimises waste and maximises resource efficiency. Companies can commit to the goals of the agreement through a declaration of adherence. In total, 127 leading food industry players are committed to measuring and providing data on their food waste. They are dedicated to implementing and reporting on initiatives both within their own companies and in collaboration with others (Matvett, 2024).

In 2020, food waste in Norway was reported to be reduced by 10% compared to 2015. Despite falling short of the 2020 goal of a 15% reduction, the industry has made significant progress in measuring and reducing food waste across households, the food industry and retail. While some sectors and industries have individually achieved food waste reductions exceeding 15%, the overall success is measured based on the collective performance of all parties to the agreement (Regjeringen.no, 2020).

The government has proposed reinforcing measures to strengthen the Industry Agreement, as the agreement is crucial in achieving the SDG 12.3 target. Since the public sector is not currently a party to the agreement, a logical propose is to incorporate public institutions that handle food in practice. These institutions range from the military to hospitals, nursing homes, central kitchens, after-school programs, kindergartens and schools. Consequently, the Norwegian Association of Local and Regional Authorities (KS) must be a party to the agreement (Food Waste Committee, 2023, p. 27).

¹ In the Food Waste Report, the seafood industry is specified as a separate sector.

2.3 Food Waste in Norway

In Norway, over 450,000 tonnes of edible food are wasted annually. This amounts to approximately 84.7 kg per person. Households are responsible for nearly half of this food waste (48%), followed by the food industry (19%), grocery/convenience/wholesalers (16%), agriculture (10%), the seafood industry (3%), service industry (3%) and education and care (1%) (Food Waste Committee, 2023).

These figures are based on the report from the industry agreement to assess the progress of the food sector towards the intermediate goal of achieving a 15% food waste reduction by 2020. The report was compiled using data reported from all categories of the food value chain. See figure 1 for a total overview.

Total	Agriculture	Seafood	Food industry	Grocery/ Convenience/ Wholesaler	Service	Education and Care	Household
453 851	46 751	12 900	84 100	73 500	15 500	5 000	216 100
100%	10%	3%	19%	16%	3%	1%	48 %

Figure 1: Overview of food waste per category in Norway in 2020, with the numbers presented in tonnes. Source: (Food Waste Committee, 2023)

2.4 The Food Waste Committee

To intensify efforts in reducing food waste after missing the 2020 goal of a 15% reduction, the Ministry of Climate and Environment and the Ministry of Agriculture and Food established a Food Waste Committee in February 2023. The mandate of this committee was to explore comprehensive measures and policy tools to achieve a 50% reduction in food waste by 2030.

2.5 What is Food Waste?

The Food Waste Committee has based its work on the definition of food waste provided in the Industry Agreement on food waste reduction, signed in 2017. The agreement defines food waste as follows:

"Food waste includes all edible parts of food produced for humans, but which are either thrown away or taken out of the food chain for purposes other than human consumption, from when animals and plants are slaughtered or harvested." The agreement further clarifies: "As a result of this definition, it is considered food waste when edible parts of food produced for humans end up as, among other things, animal feed. The parties must contribute to the best possible utilisation of resources throughout the value chain. Even if waste before slaughter/harvest is not considered food waste, the industry must still seek to

obtain data for the primary stage² and carry out measures to reduce waste”. Thus, food waste is defined as the loss of products intended for human consumption, occurring from harvest/slaughter onwards, including food repurposed as animal feed (Food Waste Committee, 2023, pp. 19–20).

In addition to the definition of food waste in the Industry Agreement, Norway must comply with two additional definitions of food waste. The first one is the definition of food waste by the EU, established by the EU's Waste Framework Directive (2008/98/EC). The EU defines food waste as food that has become waste.

The UN provides another definition of food waste: the SDG 12.3 target. In this context, food waste is defined as food that is lost at various stages of the food supply chain, including the food industry, grocery trade, food service (both private and public) and households. The main differences between the Norwegian and the two international definitions are that the EU and UN definitions include non-edible parts of food, but do not include food used for animal feed. Additionally, the UN's definition differs from both the Norwegian and EU definitions by only accounting for food waste occurring after the food industry stage (Food Waste Committee, 2023, p. 19). See figure 2 for an illustration of the three definitions of food waste.

In the proposal of a revised Industry Agreement, there is a suggestion of a new definition of food waste, aligning with the definition used by the EU. As a result of this definition, food used for animal feed will no longer be considered food waste.

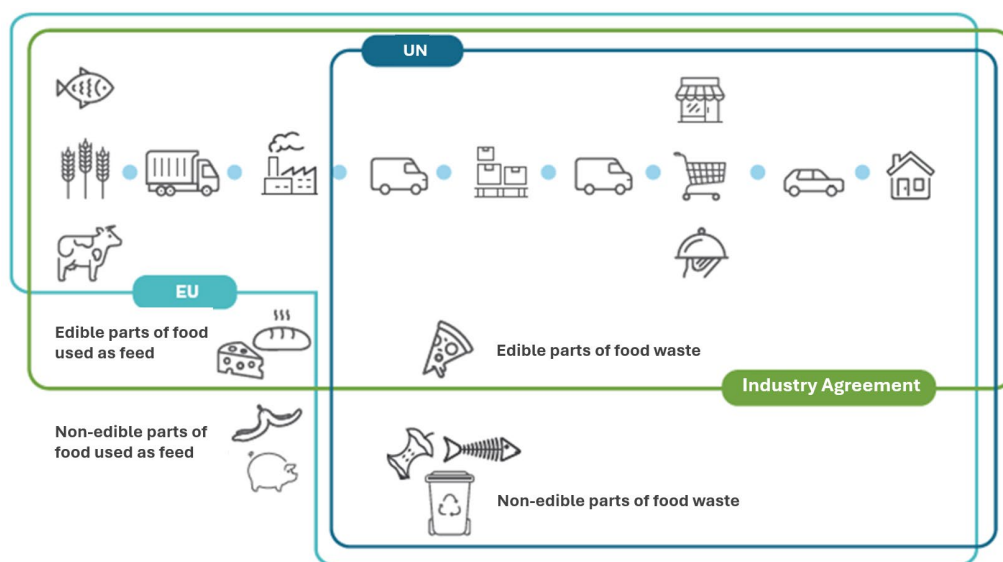


Figure 2: Different definitions of food waste under national, European, and international frameworks.
Source: (Food Waste Committee, 2023, p. 20)

² Primary stage = Production stage prior to animal slaughter and harvest

2.6 The Food Waste Report

In January 2024, the Food Waste Committee presented a detailed Food Waste Report (2023) outlining a strategy to meet the SDG 12.3 target. The report is the culmination of various stakeholders' efforts across the food value chain, including government agencies, industry representatives, research institutions, consumer organisations and Matsentralen. The main measures and findings of the report are examined below.

As previously mentioned, food waste in Norway amounts to over 450,000 tonnes annually as of 2020, with households being responsible for approximately half of this waste. The report highlights the urgent need to address this issue, and proposes measures that could reduce food waste by up to 340,000 tonnes, representing a 75% reduction, by 2030. This potential reduction is spread across different sectors, including households, the food sector, and other areas, such as public institutions. The total amount of food waste from the food sector was 170,000 tonnes in 2022. Of this, 5,500 tonnes were donated to Matsentralen, equivalent to around 3% of the total food waste. This highlights the significant potential for increasing food waste reduction through donations.

The Food Waste Committee emphasises that no single measure can halve food waste, and that various interconnected measures across the entire food value chain are necessary. The proposed measures are grouped into four main categories based on the responsible entities:

(1) Regulatory proposals by authorities

These include mandatory due diligence assessments and disclosure requirements, food waste and requirements related to planning, price reductions, and compulsory donations for the seafood and food industries, as well as wholesalers. The report recommends enhancing donation channels to food banks, promoting donations in public procurement, reducing financial barriers, providing incentives for offshore donations, and clarifying regulations on freezing produce with 'Best Before' labels. Additionally, the measures recommend offering guidance on donating unpackaged bread and developing advisory services for donations.

(2) Industry Agreement modifications

Strengthening industry standards for fulfilling due diligence assessments with best practice, expanding the Industry Agreements to include KS and relevant ministries, and increasing and standardising reporting.

(3) Assignments and guidance by authorities

Extending Statistics Norway's (SSB) responsibilities to include food waste statistics and guiding regulations for freezing and donating food.

(4) Sector-specific measures

Data sharing, promoting donations in public procurement, and reviewing practices for durability and compliance.

The introduction of new regulations and the reinforcement of existing ones are both crucial for the success of these initiatives. This includes legislative backing of due diligence

requirements as well as comprehensive food waste reporting. Collaboration between the public and private sectors is essential. Public institutions including schools, hospitals, and military institutions need to enhance their waste reduction practices, while private companies should innovate and adopt best practices to minimise waste. The public sector, particularly local governments, is responsible for communicating effectively with consumers and implementing measures to reduce household food waste.

The Food Waste Report emphasises that achieving a significant reduction in food waste is feasible through a combination of regulatory measures, industry cooperation and heightened public awareness. The success of this strategy depends on coordinated efforts across the entire food value chain, making it imperative for all stakeholders to work together towards a common goal.

The report is currently in a critical stage of implementation. Since the Food Waste Committee presented its report to the government in January this year, there has been little response from the government. Both the Climate and Environment and the Agriculture and Food Ministries were contacted to obtain an update on when the report would be finalised. Both ministries responded that the government is currently evaluating how to implement the report's recommendations. The government's recommendations and proposed new food waste legislation will ultimately be reviewed and approved by the Parliament.

In interview with Matvett, an organisation dedicated to reducing food waste in Norway, they emphasised that the government should prioritise modifying the Industry Agreement as the first reinforcing measures. According to Matvett, this is one of the most important measures in the report to reduce food waste. They further emphasised that stakeholders must collaboratively establish best practices, due diligence processes, and other key initiatives according to the intentions of the proposed new Industry Agreement. Matvett is hoping for a negotiation meeting to take place in the autumn of 2024, with an expected revised Industry agreement by the end of the year.

2.7 Food Waste Hierarchy

Matvett is owned by DMF, DLF, NHO Food and Drink, NHO Tourism and Virke, and is funded by the food sector and the government. Matvett was a leading force behind the Industry Agreement that has brought food waste to the forefront of both political and private sector agendas. The organisation served as the secretary of the Food Waste Committee, and was responsible for preparing the Food Waste Report.

The proposed revised Industry Agreement in the Food Waste Report references a resource pyramid developed by Matvett, which the parties to the agreement are expected to follow in order to reduce food waste (see figure 3). The parties commit to adhering to this resource pyramid and collaborating to enhance the utilisation of resources and raw materials through the prevention and reduction of food waste across the entire food value chain (Food Waste Committee, 2023, p. 163). According to Matvett, the resource pyramid emphasises selling

surplus food at reduced prices or donating it as a primary strategy in order to minimise waste and maximise food utilisation for human consumption.

The revised Waste Framework Directive (2018) mandates EU Member States to reduce and monitor food waste, report progress and promote food donation. Matvett's resource pyramid aligns with this directive by emphasising the prioritisation of human consumption over animal feed and non-food processing. The pyramid further supports the EU's waste hierarchy by promoting prevention, donation, and redistribution. Additionally, the EU's standard methodology for measuring food waste ensures standardised reporting, helping Member States track and reduce waste effectively, in line with the directive's goals (European Commission, 2020).

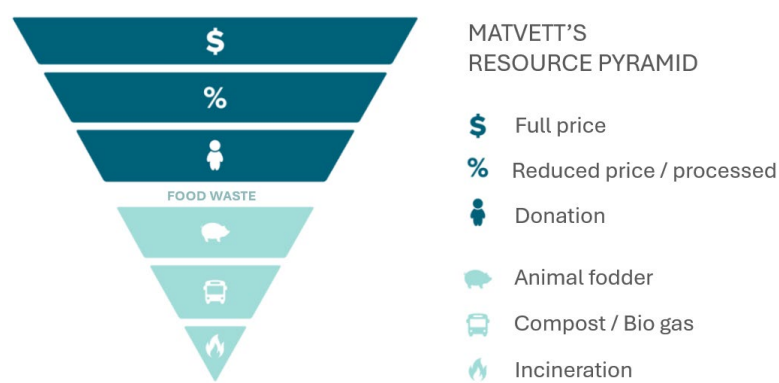


Figure 3: Matvett's resource pyramid. (Matvett, 2015)

With a broader context of food waste in place, the next chapter will build on these elements by outlining the methodology and analysis that guide the approach to addressing the problem statement.

3 Methodology and Analysis

This study employs qualitative research designed to explore the issue of food waste and donation within the Norwegian food sector, focusing on potential solutions that align with the problem statement. The goal is to explore stakeholders' views and challenges in food donation, as well as devising effective strategies to reduce food waste by enhancing donations. A qualitative approach was chosen for its ability to provide in-depth insights into complex social phenomena and capture contextual nuances of the subject matter.

3.1 Interview Guide

Structured interviews were conducted to collect information from participants selected through a power-interest grid analysis, ensuring relevance to the problem statement. The sample consisted of 20 participants, including representatives from Norway's largest grocery

store chains, producers, wholesalers, industry organisations and other key stakeholders in the food sector. Inclusion criteria required participants to have significant experience and involvement in food waste management and donation processes. For a detailed list of stakeholders, see Appendix 1 - Stakeholder List.

An interview guide was developed to standardise gathering data, ensuring consistent and rigorous stakeholder engagement. The guide facilitated interviews, preferably in person, to establish a meaningful connection with participants. It covered essential steps such as presenting the problem statement and the sponsor's role and allocating one hour for thorough discussion. The interviews began by obtaining consent to record the conversations, ensuring a focused and distraction-free environment throughout the session. This structured approach ensured that all interviews were conducted under similar conditions, allowing for reliable and comparable data collection. See Appendix 2 - Interview guide for more information.

Main questions asked stakeholder interviews:

- What are the environmental ambitions and goals of the company?
- How does the company currently address the issue of excess food production?
- Is surplus food donated? If so, how is this implemented?
- How much focus does the management team of the company currently place on food donation?
- How does the company plan to improve the efficiency of the food donation process?
- What will this require, and what are the largest barriers?
- What does the company think of the proposed measures described in the Food Waste Report? Which of these are most relevant for addressing the food waste problem?
- What is the view of the company regarding the proposed due diligence requirements in the Food Waste Report?

The interviews followed a predefined set of open-ended questions, but also allowed for flexibility in the conversation. This approach combined the structure of a standardised interview with the freedom to explore topics in more depth as they arose during the discussion. It allowed us to ask follow-up questions, probe for more details and adapt the conversation based on the stakeholders' responses.

Quantitative data from the interviews were recorded and transcribed for analysis. The privacy of stakeholders was ensured by anonymising the data and securely storing all recordings and transcripts. Each stakeholder is referred to as R for Respondent, followed by a number (R1, R2, etc.) for identification.

3.2 Data

Various data sources were utilised to support the analysis and obtain numbers and statistics related to food waste and donations. A data hierarchy helped organise data sources according to their reliability, relevance and accuracy. For this study, the data hierarchy is structured as follows:

1. The primary and most comprehensive data source is the Food Waste Report. This report represents the most recent and widely accepted compendium of knowledge related to food waste within the food sector. Using the report as a starting point is advantageous, as it offers a solid foundation crafted by government agencies, industry, research institutions, consumer organisations and Matsentralen.
2. Secondary data sources include direct data from Matsentralen and other stakeholders in the food sector who were interviewed, providing figures on food donations and waste management practices. These sources offer practical insights and complement the primary data with real-world applications, adding new information incorporated into the analysis.
3. Tertiary data sources consist of academic research, media publications and EU reports. Academic research offers theoretical perspectives and additional analysis on food waste issues. Media publications provide current information and public perception, while EU reports offer additional data and insights on regional food waste management. These sources provide background information in a broader context to support the primary and secondary data.

Utilising this structured hierarchy of data sources ensures a comprehensive and well-rounded analysis of food waste and donations.

3.3 Stakeholder Analysis

This chapter explores the process and results of the stakeholder analysis, conducted to identify and prioritise key stakeholders within the food donation ecosystem. A stakeholder analysis approach was employed to gain a thorough understanding of the sector's key players, their levels of influence and interest, and how they would be engaged through a structured interview process.

The chapter is divided into two main sections: the methodology of the stakeholder analysis and the results of the conducted analysis. The methodology section details the approach used to perform the analysis, while results of the analysis are presented in the stakeholder analysis section, providing a breakdown of the key stakeholders identified, their roles within the food donation ecosystem, and the strategic insights gained from their categorisation.

3.3.1 Stakeholder Analysis Methodology

Stakeholders were systematically identified using initial research complemented by sector-specific insights. This phase helped identify primary stakeholders, who recommended additional contacts that provided unique perspectives and valuable understanding. A series of interviews further expanded this network, enhancing the conception and contributing to a comprehensive horizontal scan, which refers to a review and comparison of global

practices and strategies in food waste management. To ensure thorough identification and proper categorisation of potential stakeholders, the Stakeholder Wheel tool (Cadle et al., 2010) was utilised.

The Power-Interest grid (Thompson, 2016) was used as a strategic tool to categorise stakeholders based on their influence and interest within the context of the project. Refer to figure 4 for more details on each quadrant of the Power-Interest grid. This structured approach enabled us to prioritise engagement efforts by focusing on stakeholders with the highest power and interest while ensuring appropriate levels of communication with those less directly involved. Stakeholders with multiple roles were categorised into groups that best reflected their primary function within the stakeholder environment. However, their various roles were considered during the evaluation of the Power-Interest grid in order to ensure an accurate assessment of their power and interest in the project.

Interviews were conducted with stakeholders who were selected based on their positioning within the Power-Interest grid. This grid guided the depth and focus of each interview, allowing us to target those with the most significant influence and interest. Interviews outside the primary criteria were only conducted when it was clear that the stakeholder could provide additional value and insight directly related to the problem statement.

	LOW INTEREST	HIGH INTEREST
HIGH POWER	These stakeholders are essential for the direction or adoption of the proposal and could potentially interfere with its success. They must be assured the solutions are practical and meet their needs.	These stakeholders are crucial for solution implementation and receive the most thorough engagement, including regular updates and involvement. They are critical in determining the most optimum solutions, and will likely be the ones who will implement them.
LOW POWER	Not directly engaged, these stakeholders may be informed indirectly through broader communications or during later phases of the project.	These stakeholders are invested due to the potential impact on their organisations or roles. Though their limited influence reduces their role in decision-making, their input is vital for ensuring practical solutions across the supply chain. Engaging them through feedback channels and ongoing dialogue improves solution practicality and supports successful implementation.

Figure 4: Power-Interest Grid overview. Source: (Cadle et al., 2010)

3.3.2 Stakeholder Analysis

Based on the stakeholder wheel described in the methodology section, each stakeholder falls into at least one of the groups shown in figure 5. The stakeholder groups have been tailored to align with Matsentralen's specific context. Management was not included in the stakeholder wheel, as Matsentralen's Management, specifically CEO Per Christian Rålm, serves as the central figure in the stakeholder wheel and the sponsor of this consultancy project. The food sector network is extensive, and organisations listed in the various groups are examples and often the most prominent players. See Figure 6 for detailed description.



Figure 5: Groups in the Stakeholder Wheel of Matsentralen

Groups:	
Funders	Funders, classified under the group Partners of Stakeholders, provide financial support to increase food donations and enhance sustainability efforts within the food sector. NorgesGruppen is a major supplier and funder for Matsentralen. It owns around 1,800 stores and has established the HANDLE fund to promote sustainability. This fund is dedicated to fostering a more sustainable food value chain in Norway and is committed to distributing NOK 100 million by 2025. The fund supports innovative projects transforming the food sector, aligning with NorgesGruppen's broader sustainability goals. The Kavli Fund, owned by Kavli Norge AS, is dedicated to promoting sustainable practices within the food sector. It allocates its profits towards philanthropic efforts, supporting food waste reduction initiatives. This involvement allows the Trust to play a vital role in promoting sustainable practices.
Related Organisations	The European Food Banks Federation (Fédération Européenne des Banques Alimentaires, FEBA) and Global Standards 1 organisation (GS1) play critical roles outside the direct supply chain. FEBA promotes cross-border cooperation and the sharing of best practices among European food banks. GS1 develops and maintains the barcode and open standards used across all industries to connect physical products to their digital counterparts through product data—pivotal for advancing industry standards and reducing food waste.
Suppliers	The focus is on suppliers of perishable food, where the food waste challenge is most significant. Suppliers are all the players that donate food to Matsentralen. Notable suppliers include NorgesGruppen, Coop Norge, Rema and Bama.

Regulators	Regulatory oversight in Norway involves multiple bodies, including The Norwegian Food Safety Authority (Mattilsynet) and the Agriculture and Food Ministry. DMF contributes to the legislative framework influencing food waste policies by drafting critical reports that shape upcoming regulations.
Matsentralen Employees	Matsentralen's effectiveness is greatly enhanced by the dedication of its Regional Managers and a vast network of volunteers. These individuals are essential in managing day-to-day operations, particularly in coordinating the collection, processing and distribution of donated food. While Regional Managers oversee operations and maintain organisational standards, volunteers are crucial for executing these plans, providing the necessary manpower to handle large volumes of food redistribution quickly and efficiently. Their combined efforts ensure Matsentralen operates smoothly and responds effectively to the dynamic needs of food donation and distribution. This synergy between staff and volunteers is pivotal for maintaining the high level of service and reliability of Matsentralen.
Matsentralen Board	The Matsentralen Board, identified as the "owners" of this project, includes representatives from various sectors noted in other stakeholder categories. Board members prioritise Matsentralen's objectives over their organisational interests, acting as a unified entity to guide the organisation towards reducing food waste efficiently.
Competitors	While Matsentralen identifies no direct competitors, organisations like Too Good to Go and Havaristen operate in similar domains by redistributing food at reduced prices, indirectly competing with Matsentralen. Businesses discovered in the horizontal scan e.g. Food Mesh, were interested in expanding their operations internationally.
Recipient Organisations	Over 560 charitable organisations receive and distribute surplus food to those in need, ensuring the effectiveness of the food donation system. These include organisations like Blåkors and Kirkens Bymisjon, which rely heavily on Matsentralen for support.

Figure 6: Grouping of stakeholders identified by using the Stakeholder Wheel.

After identifying the stakeholders of the food donation ecosystem through use of the stakeholder wheel, each stakeholder was categorised in the Power-Interest grid. Thus, stakeholders with high power and high interest, which are crucial for the implementation of solutions that can increase food donation, were clearly mapped, allowing a focus on stakeholders most likely to influence project outcomes. See figure 7.

	LOW INTEREST	HIGH INTEREST
HIGH POWER	Ministry of Finance Department of Agriculture EU food regulatory bodies	Matsentralen's Board Funders Climate and Environment Ministry Suppliers Wholesaler
LOW POWER	Food Mesh Mattilsynet	Employees Volunteer Corps FEBA Recipient Organization Competitors GS1 Grocery Chain DMF DLF

Figure 7: Stakeholder Power-Interest Grid for Matsentralen

3.4 Scenario Planning

Scenario planning was employed in this project to systematically evaluate Matsentralen's strategic options by exploring different potential futures. This approach allowed us to identify the most effective solutions under varying circumstances, ensuring that Matsentralen remains adaptable in the face of uncertainty.

3.4.1 Scenario Planning Methodology

Scenario planning was applied to evaluate potential solutions within the consultancy project. Scenario planning is a process that encourages innovative and imaginative thinking to help an organisation better prepare for the future (Garvin & Levesque, 2006, p. 1). This approach allowed for a structured analysis of the main elements influencing the operations of Matsentralen, offering more profound insights into potential uncertainties that could impact future decision-making.

The key focal issue of this analysis is the problem statement of this consultancy project. Thus, the process began by identifying the driving forces shaping the environment of Matsentralen. Driving forces are the themes and trends expected to impact, influence and significantly shape the key focal issue, with the major categories of these forces being social dynamics, economics, political affairs, and technology. (Garvin & Levesque, 2006, p. 2). These driving forces were derived through stakeholder communications and insights from the Food Waste Report. From this analysis, two critical driving forces were selected as the most significant variables and subsequently placed in a scenario matrix to develop four distinct narratives reflecting possible future outcomes. The scenario time horizon was set to 2030, in alignment with the SDG target of reducing food waste by 50% within this timeframe.

The scenarios provided a foundation for analysing various solution options. By exploring different potential futures, we were able to develop a list of viable solutions tailored to address both known factors and emerging uncertainties. Options seen to be viable in all four quadrants are correspondingly more resilient, as they are tolerant of changes/uncertainties

in the two selected variables. Additionally, the scenario matrix offers Matsentralen a valuable framework for future strategic decision-making, enabling the organization to anticipate and respond to early warning signals of environmental shifts. This proactive approach allows Matsentralen to remain agile and adaptable in an ever-changing landscape, ensuring that strategic decisions are informed by a thorough understanding of potential future scenarios.

3.4.2 Scenario Planning Analysis

The focal issue identified for the scenario planning is ensuring that Matsentralen can reliably receive and distribute quality food products from suppliers in order to efficiently reduce food waste. This goal is the foundation for developing different scenarios, as it encapsulates the primary challenge Matsentralen faces in its food donation and redistribution efforts.

The driving forces influencing the focal issue were identified, incorporating predetermined and uncertain factors that could shape the future environment of Matsentralen. See Appendix 3 - Scenario Planning analysis - for an overview of the identified driving forces and their categorisation.

The top two uncertain driving forces were selected for scenario development:

- (1) Legislative requirements
- (2) Supplier collaboration/engagement/ commitment

Each driving force create an axis of uncertainty, with polar cases at each extremity:

- (1) Strict and voluntary
- (2) High and low

The different futures that result from the interaction of the uncertain driving forces creates four different scenarios. These scenarios are in the case named compliance, proactive, status quo and collaborations. They are plausible, alternative hypotheses about how the world may unfold, designed to highlight risks and opportunities for the organisation. Effective scenarios challenge the thinking of the participants by revealing the diverse factors that could shape the future, with no scenario being definitively right or wrong (Garvin & Levesque, 2006, p. 3). The different scenarios are shown in figure 8.

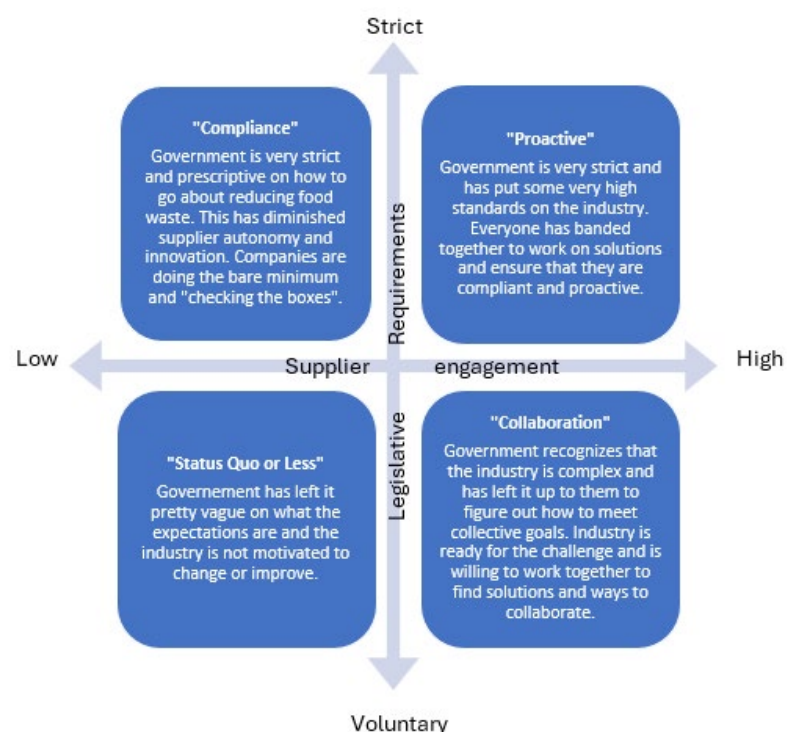


Figure 8: Four different scenarios for possible futures

After classifying the four different scenarios, the implications and relevant options for each scenario were evaluated, as outlined in Appendix 4 – Scenario narratives.

Outcomes from the scenario analysis have provided insight on early warning signals that are useful in anticipating potential scenarios and understanding what options may be necessary to implement.

Signs of emerging stricter legislation may include policy reforms, new laws, shifts in governance, increased public pressure on sustainability, and greater EU regulatory influence. Alternatively, signs of reduced legislative strictness could include evolving EU-Norway relations, post-election political shifts, governance changes towards deregulation, or enhanced government-industry collaboration. Enhanced communication and engagement with key stakeholders might also indicate a move towards a more flexible and cooperative regulatory framework.

Supplier engagement may change depending on a variety of factors. It is therefore crucial to actively maintain or restore engagement to ensure positive outcomes. Legislative requirements and other significant driving forces can either hinder or facilitate changes in engagement levels. Declining engagement may be indicated by reduced communication from partners, leadership changes, fewer resources for managing the issue, or economic downturns impacting the sector's stability.

The solutions outlined in chapter 5 are analysed in relation to the four scenarios described above. In section 5.3, each solution is evaluated within the context of each scenario, allowing us to narrow down and recommend the most viable options from the wide range of potential solutions. The rating has considered how each solution might perform if any one of the scenarios becomes a reality. Key questions include whether these solutions would represent sound or risky investments in each context, and which would prove to be the most resilient and functional across all scenarios. Additionally, the analysis explores whether certain solutions could not only adapt to but also influence and potentially improve the direction of a given scenario.

3.5 Horizontal Scan

The horizontal scan was essential to the research methodology, examining global food waste management practices. It focused on collecting insights from international frameworks and initiatives to improve donation processes. The approach utilised comparative analyses to enhance the understanding and application of these global strategies. The approach was as follows:

1. Literature review: Academic journals, industry reports, governmental publications, and other relevant documents were reviewed to understand the current landscape of food waste management strategies worldwide.
2. Expert interviews: Interviews with key experts and stakeholders in the food waste management sector were crucial. These discussions provided first-hand insights into the

practical application of strategies and the challenges and successes experienced in different regions.

3. Utilisation of existing comparative analysis: Instead of conducting a separate comparative analysis, a comprehensive analysis already provided in the Food Waste Report was utilised (Food Waste Committee, 2023). This approach ensured that the findings were based on a well-established framework, grounding the conclusions in robust, previously vetted research.

3.6 Evaluation of solutions

Solutions were identified through a combination of successful practices observed in other regions during the horizontal scan and insights derived from the Food Waste Report, the analysis, and interactions and input with the stakeholders. The team proposed eight solutions drawing on knowledge and inspiration from a variety of sources. This multifaceted approach ensured the development of comprehensive, practical solutions tailored to increase food donation to Matsentralen, and to minimise food waste.

The eight solutions were discussed and analysed using the scenario planning results. The solutions that showed resilience in all four potential scenarios were considered most robust and likely to succeed (Garvin & Levesque, 2006, p. 8). Low-cost, straightforward actions that could drive progress or were already regarded as viable by stakeholders were also taken into consideration. Four selected solutions based on their scenario robustness scores were then analysed using a Weighted Decision Matrix (see appendix 6). This type of decision matrix is effective in situations where determining the optimal approach is complex, involving multiple criteria with varying levels of importance (Brereton, 2022).

Criteria for evaluation of the four solutions were developed based on stakeholder interviews and the horizontal scan as well as the Food Waste Report, and shared with Matsentralen to ensure alignment. The criteria were assigned weights on a scale of one to four, reflecting their level of importance in relation to the problem statement. Each of the four solutions was given a rank from one to four for its ability to fit the criteria. That rank was then multiplied by the weight to find a weighted score. The total of all the scores for each solution determined the highest scoring solution for consideration (Brereton, 2022). See figure 9 below for an overview of this process:

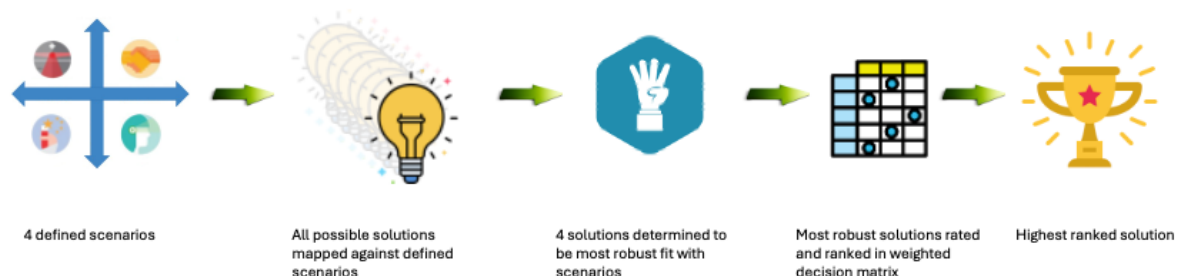


Figure 9: Overview of process for evaluating solutions

4 Findings

This chapter presents barriers and opportunities affecting food donations to Matsentralen, as identified through stakeholder interviews and a horizontal scan of global practices. Concurrently, opportunities for streamlining donation processes, enhancing Matsentralen's operational capabilities, and leveraging technology to improve logistics are highlighted.

Key findings indicate that strengthening management's commitment and simplifying financial incentives are crucial for increasing the regularity and effectiveness of food donations. Additionally, enhancing communication about Matsentralen's capacities and implementing advanced technological solutions are essential for optimising the overall donation process. Each barrier and opportunity is analysed to develop targeted solutions that address these critical issues, ensuring a sustainable and efficient approach to food donations.

The findings in this chapter highlight the organisational, regulatory, and operational obstacles that limit the potential for increased food donations. Additionally, the chapter identifies opportunities to improve donation processes, ensuring a more efficient and sustainable approach. Barriers and opportunities identified in this chapter serve as the basis for the development of solutions, innovations and suggested structural changes to enhance food donation. An overview of the barriers and opportunities that were discovered can be seen in figure 10 :

Barriers	Opportunities
Inconsistent commitment from management	More resources at Matsentralen for supplier follow-up
Lack of efficient donation processes	The Food waste report
Financial considerations	Awareness of Matsentralen
Regulatory restrictions	Fundings
Transportation and logistics	Many volunteers
Reputation damage	Applying technology and innovation
Limited awareness of Matsentralen	Changes in VAT and income tax regulations
Time aspect	

Figure 10: Barriers and opportunities affecting food donation, identified in interviews with stakeholders

4.1 Barriers

Interviews with key stakeholders revealed several barriers affecting the food sector's ability to increase food donations to Matsentralen. The identified barriers are as follows:

4.1.1 Inconsistent commitment from management

Inconsistent commitment to food donation from management at the suppliers was found to lead to irregular donations. Several organisations interviewed claimed that, although management supported food donations, their actions did not consistently reflect this commitment. Matsentralen believes that this is the most significant barrier to increasing

food donations. This finding aligns with the Food Waste Report, which also identified a lack of support as a significant barrier to increasing food donations (Food Waste Committee, 2023, p. 46).

4.1.2 Lack of efficient donation processes

Many of the interviewed suppliers lacked efficient donation processes. This was evident through unpredictable and sporadic food donations, which varied depending on the personnel on shift at a given time.

R11 stated: "We have inadequate procedures for handling the donation process effectively. Nobody has a main responsibility for donations, and it is up to the employees on shift to decide how and if donations are made. This area has significant room for improvement, because we have goods that can be donated".

Similarly, R4 commented: "The donation process is mainly manual and unstructured. Formalising this process could significantly improve efficiency."

This may result from the previous barrier of inconsistent commitment from management.

The Food Waste Report (Food Waste Committee, 2023, p. 46) identified a need for more efficient processes within companies and insufficient employee competence as barriers to increasing food donations. R12 echoed this barrier: "Donation today is a manual, unstructured process. Making this process more formal could improve the overall process." This aligns with findings that employee competence affects the consistency and effectiveness of donation practices. Inadequate training and unclear procedures contributed to the unpredictability of food donations, highlighting the need for more structured and reliable systems. R10 emphasises this: "If Matsentralen had more competence and capacity, we could donate more food. Today, if we do not have time to go through an entire pallet, it will not be donated, even though some of the food on the pallet is suitable for donation."

These findings underscore the importance of standardising food donation processes. Establishing clear guidelines and assigning defined responsibilities can ensure consistent and effective donations across shifts. This approach will reduce reliance on individual employee discretion and improve the overall efficiency of food recovery efforts, aligning with sustainability objectives within the industry.

4.1.3 Financial considerations

Most of the interviewed suppliers emphasised that financial priorities often favour cost-saving and revenue generation over food donations, which can be perceived as less financially beneficial. Current legislation does not provide optimal incentives for food donation. To examine this in further detail, both VAT and income tax legislation were considered.

VAT regulations

When goods are donated, VAT is calculated based on the market value of the good being donated, in the same manner as if the goods were given as gifts. However, in the specific case of food donation, relevant VAT legislation in Norway was changed on the 17th of June 2016. As a result of this change, "Food that is donated free of charge to a recipient who further distributes this on a charitable basis, is exempt from VAT" (Lov Om Merverdiavgift § 6-19, Section 2, 2016). As such, food donations are exempt from VAT, as is the case for food that is destroyed³. This is a zero-sum game, as VAT Outgoing is reclaimed both when donating and destroying food. Similarly, VAT Incoming is not payable when donating or destroying food, due to the exemption clause related to food donation described above. Thus, there is currently no VAT-related advantage in donating food rather than destroying food.

To clarify current tax regulations, the Norwegian tax authorities were contacted. As the response time for such queries is several months, assistance from the legal department of the NHO was enlisted to understand the relevant tax law. As a result, it became clear that the tax law related to tax deductions for food donations is not intuitive. This lack of clarity results in ambiguity on the part of potential donors, who cannot confidently specify and calculate relevant tax deductions. Compounding this issue, many potential donors are not aware that food donations may be eligible for tax discounts, which may result in organisations not donating food at all. This was confirmed during the interviews, where R19 stated "We don't claim specific tax discounts related to food donation."

Tax laws

Norwegian tax regulations indirectly encourage destroying food rather than donating it, as the destruction of food represents a tax advantage. The destruction of food may be booked as a tax-deductible loss to a significantly larger extent than is the case with donation.

In the example of food donation by a store, this may be illustrated as follows:

³ In this context, food destruction is the conversion of food to products not intended for direct human consumption, e.g. Animal fodder, bio gas, compost etc.

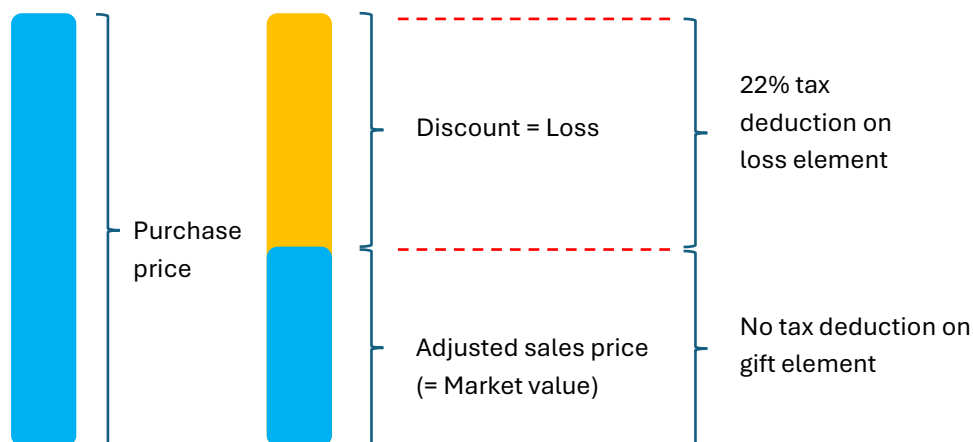


Figure 11: Taxation related to food donation from stores

Stores mark down the prices of food that is approaching its sell-by date, often by 40%. This discount⁴ can be booked as a financial loss, enabling a tax deduction of 22% of its value. The remaining discounted food price (=Adjusted sales price) is regarded as a gift for tax purposes and is therefore subject to taxation.

Considering the alternative of food destruction, the difference in terms of taxation is significant:

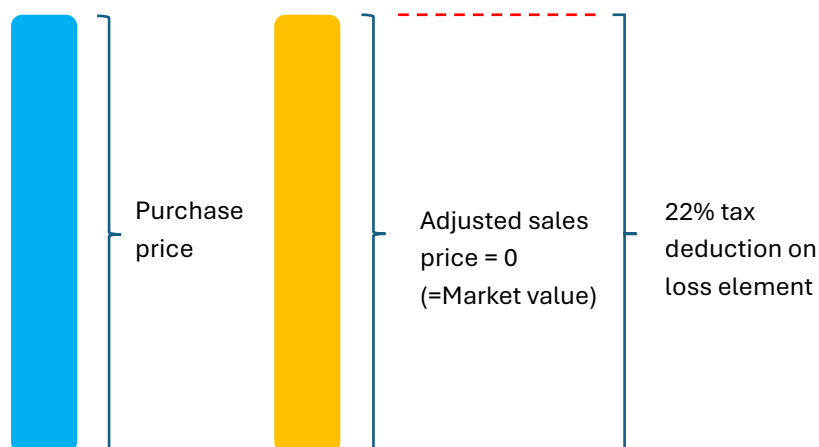


Figure 12: Taxation related to food destruction

When destroyed, the value of the food (= the adjusted sales price) is set to zero, as it is no longer classified as food for human consumption. In this case, the loss element described above constitutes the entire purchase price of the food. As a result of this, a 22% tax reduction may be claimed on the entire purchase price, as there is no gift element, as in the donation scenario above.

The conversion of food to other products incurs additional costs. These expenses, including costs related to transport, conversion to biogas, animal fodder, compost or landfill, also

⁴ Discount = Purchase price – Market value = Loss element

enable 22% tax reduction, representing an additional financial incentive for food destruction:

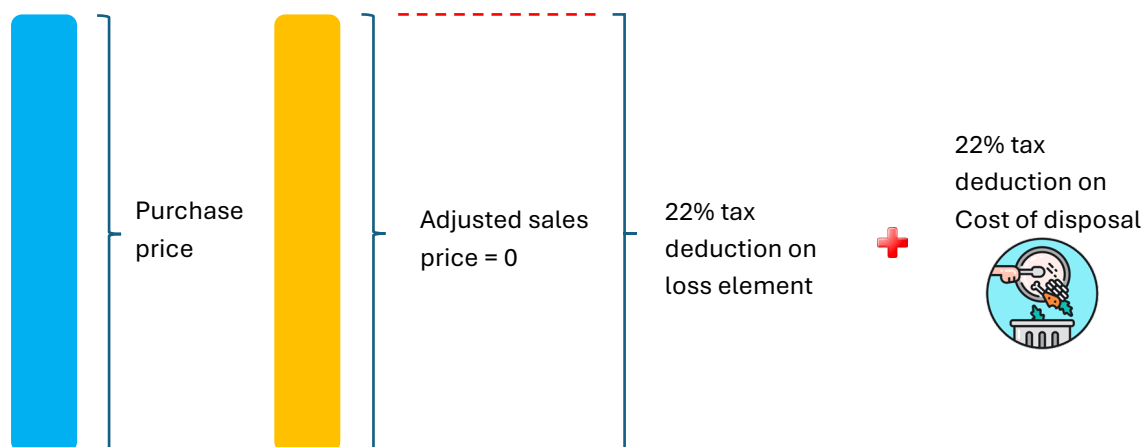


Figure 13: Taxation related to food destruction and related disposal costs

The tax advantage of destroying food appears to be widely utilised, as confirmed by a bio gas producer we interviewed, who confirmed that they regularly receive food that has not passed beyond its expiration date, which could otherwise have been donated.

Although tax legislation appears to be more comprehensible related to the donation of food from stores, it is less so in the case of food donation by producers and wholesalers. Producers and wholesalers do not discount food as it approaches its expiry date, as the food will leave the producer/wholesaler well before this time. As such, producers and wholesalers do not fit into the model for food donation from stores as described above, as there is no specified discount with which to specify a loss element:

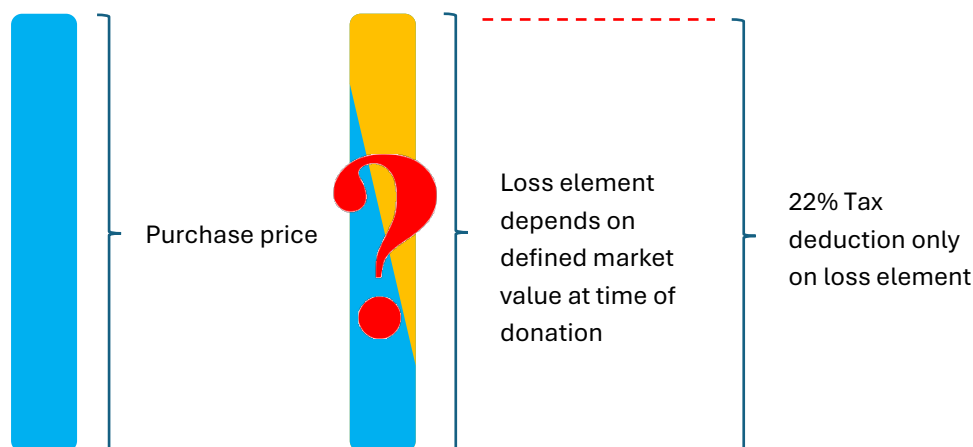


Figure 14: Taxation related to food donation from producers/wholesalers

Instead of a defined discount with which to specify a loss and corresponding market value and gift element (where the gift element is not eligible for tax deduction), the market value of the donation from the producer/wholesaler has to be specified and justified on a case-by-case basis. There are no specific guidelines on how such justification should be formulated, making it difficult to calculate and predict related tax deduction elements. This is confirmed by the legal department at NHO, who confirm that “As far as we know there have been no

statements from the Ministry of finance or the tax authorities regarding taxation in these cases, meaning that they may be subject to ambiguity”. Furthermore, beyond confirming that tax deductions are only applicable to specified loss elements, the NHO legal department state that “In all cases it is important to clearly document considerations related to market values in case this is queried by tax authorities.”

In addition to the difference in income tax related savings described above, a potential donor may also incur further costs related to food donation, e.g. related to partitioning, re-packaging and temporary storage, further exacerbating the problem of food donation being more costly for donors than food destruction. As these expenses are related to the gift element (see Figure 11 above) they do not qualify for tax deductions in the same manner as costs related to disposal in the case of food destruction (see Figure 13 above).

As the relevant legislation is unclear, it is not possible to accurately calculate and compare the income tax advantage of food destruction over food donation. However, using a conservative estimate of the gift element and related value at the time of donation, it is nevertheless clear that food destruction is several times more financially advantageous than food donation. (See Appendix 7 - Financial modelling of food donation and destruction for a simplified financial model comparing the tax advantages of food donation and different types of food destruction, with accompanying assumptions).

4.1.4 Regulatory restrictions

Several regulatory restrictions were found to hinder food donations. One of the most significant barriers for R8 is the hygiene requirements for food sold in open packaging, such as food in open paper bags. Hygiene requirements prohibit food in open packaging from being donated. Consequently, this food is repurposed as animal feed, which is food waste.

The Food Waste Report (Food Waste Committee, 2023, p. 46) identifies current regulations and their enforcement as significant barriers to increasing food donations.

4.1.5 Transportation and logistics

There are barriers to increasing food donations related to transportation and logistics. An example from R8 illustrates this issue. They collect unsold food from grocery stores at the end of the day for donation, and sometimes, the van from Matsentralen arrives before all R8’s vans have returned from their collection trips. As a result, food that comes after the Matsentralen van has left ends up as animal fodder.

Another example of this type of barrier is the distance between e.g. R10’s units and Matsentralen in rural areas. Long distances make it both difficult and costly to donate food.

4.1.6 Reputation damage

Several suppliers often hesitate to donate food due to concerns about damaging their brand reputations related to the perceived quality and safety of the donated food. R10 mentioned that if one pallet of food potentially has a small portion of spoiled food, they do not donate

the pallet for fear of damaging their reputation, as they are not confident of Matsentralen's competence and capacity related to sorting and discarding food not fit for human consumption, e.g. because it has decayed beyond acceptable levels for human consumption.

Another aspect of this is when companies mislabel their products. Inaccurate labelling can result in businesses discarding rather than donating food, as the risks of distributing products with unclear or incorrect content information could potentially harm their brand reputation. In instances of a market withdrawal with a yellow code (not life-threatening, often due to mislabelling), R7 has observed that several suppliers opt to destroy the goods rather than donate them, fearing damage to their brand reputation.

4.1.7 Limited awareness of Matsentralen

The limited awareness of Matsentralen's activities reduces engagement from potential donors, was expressed as a barrier during the interviews. It was discovered that Matsentralen has substantial capacity for sorting donated food from suppliers and the ability to relabel inaccurately or incorrectly labelled products. These are some examples that illustrate the limited awareness of Matsentralen's activities and capabilities.

Matsentralen have themselves identified limited awareness as a barrier.

4.1.8 Time aspect

The Food Waste Report found that time is a barrier to food donation, as surplus food often has a short shelf life (Food Waste Committee, 2023, p. 46).

4.2 Opportunities

In addition to identifying barriers, interviews with stakeholders and further investigation have revealed several opportunities to enhance the food sector's ability to increase food donations to Matsentralen. These opportunities are as follows:

4.2.1 More resources at Matsentralen for supplier follow-up

Matsentralen is set to install a new Customer Relationship Management (CRM) system to simplify the management and supporting of their suppliers. Additionally, they are hiring a new full-time employee dedicated to supplier engagement and support. These are new resources that Matsentralen has not had before, and the organisation has highly anticipated them. With these enhancements, Matsentralen aims to improve supplier follow-up and foster stronger relationships with their partners, ensuring more efficient and reliable donation processes.

4.2.2 The Food Waste Report

The Food Waste Report (Food Waste Committee, 2023, pp. 47–54) outlines proposed measures and initiatives within the value chain, presenting a significant opportunity for increased food donation, which currently addresses only around 3% of the total food waste in the food sector. Food donation is recommended as a concrete strategy to reduce food waste. This is done by proposing a change in regulation in order to introduce a due diligence requirement for food waste which includes food donation (see section 2.7). Furthermore, the report suggests strengthening the Industry Agreement to ensure that due diligence assessments align with best practices, as well as expanding the agreement to encompass more stakeholders (see section 2.2).

The Food Waste Report represents an increased awareness of food waste and food donation.

4.2.3 Awareness of Matsentralen

By detailing concrete strategies to reduce food waste, such as regulatory changes and strengthened Industry Agreement, the Food Waste Report not only addresses systemic issues within the food sector, but also underscores the importance of food donation to Matsentralen. This increased understanding gives Matsentralen an opportunity to raise its profile, attract more donors and engage the public more effectively. Matsentralen can capitalize on this opportunity to highlight their expertise in food processing and preservation through initiatives like the Matsentralen Kitchen Project, where surplus food is transformed into ready-made meals. Additionally, their ability to relabel and repackage large quantities of food further demonstrates their capacity, increasing awareness within the food sector of the valuable services they offer.

4.2.4 Funding

Increased funding for Matsentralen from the State Budget, along with private sources such as NorgesGruppen's HANDLE fund and Kavli Norge's Kavli fund, represents a significant opportunity to enhance food donation efforts. Without financial stability, Matsentralen must divert time to fundraising, pulling focus away from its core mission. However, with consistent support from both public and private funding, Matsentralen can fully concentrate on maximizing food donations, reducing waste, and supporting those in need.

4.2.5 Many volunteers

Matsentralen relies on a dedicated team of volunteers who play a crucial role in distributing food to those in need. These volunteers are essential to the organisation's operations, as they help to ensure that donated food is sorted, packed and delivered efficiently. Volunteers help Matsentralen maximise its impact on reducing food waste and alleviating hunger by engaging in various tasks, from logistical support to direct distribution.

According to Matsentralen, despite having a substantial number of volunteers, capacity constraints occasionally require turning food away. This presents a significant opportunity:

Matsentralen could streamline the volunteer process with a dedicated volunteer coordinator and optimise its current volunteer capacity. This enhancement would allow Matsentralen to increase its efficiency further and expand its reach in serving the community.

4.2.6 Applying technology and innovation

Matsentralen can apply technology and innovative solutions to increase food donations and streamline operations. Logistics, communication and food tracking advancements could significantly enhance food donation efforts. Additionally, exploring innovative approaches, such as developing new food products from surplus food and/or establishing more flexible redistribution models could address specific operational challenges. This is supported by R13: "Optimizing the digital flow of goods by replicating the process from the producer to the wholesaler and using the same process from the wholesaler to Matsentralen. This will reduce the randomness of individual work and help Matsentralen plan what to distribute as fresh food and what to freeze."

Initiatives like the Goat Project showcase how Matsentralen can creatively utilize surplus food to develop valuable products. In this project, Fatland, a meat producer and supplier, NorgesGruppen, and Matsentralen collaborate to utilise "forgotten species". An example of this may be seen in the case of male goats. Instead of being culled at birth due to high feeding costs, these goats are fed to a certain age and then slaughtered. The meat is donated to Matsentralen's Kitchen project, a project where Matsentralen prepares ready-made meals using surplus food. Subsidised by NorgesGruppen's sustainability fund HANDLE, this project focuses on donation rather than financial gain, covering the costs for farmers and Fatland.

4.2.7 Changes in VAT and income tax regulations

Changes in VAT and income tax regulations, as well as associated deductibles, will make food donation more economically viable and thus more financially competitive than food destruction. A critical insight from the interviews is the importance of financial incentives for encouraging food donations. As R9 emphasises: "Food donations require economic incentives to be truly effective. There is considerable room for improvement in structuring these incentives."

The findings highlight the organisational, regulatory, and operational obstacles that limit the potential for increased food donations, while also identifying opportunities to improve donation processes for a more efficient and sustainable approach. These barriers and opportunities form the foundation for the proposed solutions, innovations and structural changes aimed at enhancing food donation efforts. Before presenting these findings, an exploration of how other countries manage food waste will be conducted.

4.3 Horizontal scan

A comprehensive horizontal scan was executed, assessing approaches from various countries and organisations, including the EU, in addressing food waste through food donation. The scan also explored how businesses in other countries utilise technology to streamline the donation process. Specifically, practices in France and Lithuania are examined, as these represent extremities in terms of enforced legislation and voluntary financial incentives.

Considering the Food Waste Report, which included a horizontal scan, the findings align with known global strategies adapted for specific locations. This underlines the importance of tailored approaches considering local conditions and stakeholder involvement.

4.3.1 France

France has pioneered the global fight against food waste through robust legislative measures initiated in 2016. These laws require large supermarkets to donate unsold food that is fit for consumption to charities, fundamentally altering the business practices of food retailers and broadening food access for those in need. Over time, this requirement has expanded to include a broader range of retailers, embedding food donation deeply into retail operations across France (Food Waste Committee, 2023).

While these measures have enhanced food security and minimised environmental impact, they also bring notable economic burdens, particularly for smaller retailers, as a result of increased costs related to storage, transport and handling. The legislation, although well-intentioned, has faced challenges in enforcement consistency and depth, resulting in varying levels of compliance and effectiveness across regions (Club, 2023; Sokolova, 2023).

Moreover, the inflexible nature of the donation requirements has occasionally led to mismatches between the types and quantities of food donated and the actual needs of charities. This can occasionally lead to additional food wastage at the point of redistribution, highlighting the complexities of implementing a 'one-size-fits-all' policy approach (BBC News, 2015).

According to the 2020 food waste data, food waste in France has decreased by 10% between 2016 and 2020 (European Environment Agency, 2023, p. 12). France remains committed to its goal of halving food waste by 2025 as part of the National Covenant Against Food Waste, which calls for collaboration among a wide array of stakeholders to refine and adapt strategies to the dynamic needs of the food supply chain (Futures Centre, 2024).

4.3.2 Lithuania

In contrast to France's legislative approach, Lithuania has adopted a proactive approach to managing food waste by implementing various incentive policies rather than relying solely

on stringent legislation. These incentives encourage voluntary compliance and promote sustainable practices among businesses and consumers.

For instance, the Lithuanian government offers tax incentives for companies that donate food, thereby reducing their fiscal burdens and providing a financial incentive to redirect surplus food away from landfills. Major retailers must develop comprehensive waste reduction plans to qualify for VAT benefits on food donations. This is further supported by mandatory agreements implemented in November 2024, requiring supermarket chains to enter food donation contracts with charities, as stipulated by the latest food laws (Ministry of agriculture of the republic of Lithuania, 2023).

Additionally, the country invests in public awareness campaigns and educational initiatives to alter consumer behaviours—such as improving food storage techniques, meal planning and understanding product dating—to reduce food waste. (Ministry of agriculture of the republic of Lithuania, 2023). While these initiatives show promise, it is still too early to know how effective they will be in practice.

4.3.3 International digital tools

The findings highlight a significant shift towards virtual food banks. These banks leverage digital platforms to optimise the food donation process, significantly impacting the efficiency and reach of food distribution efforts. Platforms like Foodmesh in Canada and FoodCloud in Ireland exemplify this trend, offering models that streamline interactions between food donors and charitable organisations.

FoodMesh, operating in British Columbia, facilitates efficient connections between donors and charities, ensuring that food reaches those in need. It also generates valuable data about the donations, which is sold to interested parties, creating an additional revenue stream that supports the service.

FoodCloud plays a similar transformative role in Europe, and has expanded its operations from Ireland to the UK, the Czech Republic and Slovakia (*FoodCloud*, 2013). This platform integrates directly with the IT systems of retail stores, allowing for real-time updates on available food donations, thereby significantly reducing logistical costs and complexity associated with traditional food bank operations. As Balasz Cseh from FEBA explains: "Virtual food banking, such as the model employed by FoodCloud, allows charities to collect food directly from retail stores. This system eliminates the need for central warehousing, significantly reducing logistics costs and simplifying the distribution process."

These digital tools effectively streamline food redistribution and enhance transparency and operational efficiency across the donation spectrum.

Further insights from FEBA representatives emphasise the efficiency of these tools and models: "Many European food banks are transitioning from centralised models to virtual models, which allow for more agile and cost-effective food distribution. This is part of a

wider trend, where virtual food banks coordinate the actions but do not handle food physically, acting as a main contractor towards retail chains."

The findings suggest that adopting virtual food banks addresses the operational challenges and high costs traditionally associated with physical food banks. These digital platforms provide scalable solutions that can transform global food donation practices, offering quicker response times and reduced overheads.

4.4 Matsentralen Supply Chain

To analyse Matsentralen's supply chain, the focus was placed on the flow and bottlenecks associated with it. This analysis, along with its findings, will be detailed in the following sections.

4.4.1 Supply Chain

Matsentralen's supply chain is designed to manage and optimise the redistribution of surplus food across various stages - from production to consumption. Figure 15 below details these stages. Despite the system's efficiency, Matsentralen currently receives only around 3% of the total surplus food in the value chain (Rålm, 2024). Matsentralen's approach is not linear but multifaceted, engaging with producers, wholesalers and retail stores to intercept surplus food at each critical juncture.



Figure 15: Flowchart of surplus food from the food sector to recipients through Matsentralen

4.4.2 Supply Chain Flow

Matsentralen's supply chain is complex, with surplus food entering from different points of the food distribution network. The process can be broken down into different flows as seen in Figure 15 above. This section examines where Matsentralen sources its donations and the proportion contributed by each stage of the supply chain (see Figure 17). It also analyses how much each stage donates relative to the total food waste they generate, referred to as the food waste to donation ratio (see Figure 16).

Wholesalers

Surplus food at the wholesale level primarily arises when products fail to meet sales forecasts, leading to excess inventory. This surplus often results from forecasting errors, changes in demand, weather conditions, pricing fluctuations, or discrepancies between ordered and sold quantities. Matsentralen works closely with wholesalers to intercept these

surplus goods, ensuring they are redirected before becoming waste. According to 2023 data from Matsentralen, 45,4% of their food supply comes from wholesalers (see Figure 17).

Wholesalers have a food waste to donation ratio of 47%, making them the stage in the supply chain with the highest ratio among the three stages - producers, wholesalers, and retail stores. This indicates that a substantial portion of surplus food at the wholesale level is successfully redirected as donations rather than going to waste. The high ratio suggests that wholesalers play a crucial role in the food donation process, but there are still some potentials to further enhance food redistribution efforts and minimise waste.

Producers

Surplus food is sometimes generated directly at the production level because of overproduction or the failure of products to meet aesthetic standards. Matsentralen collects this surplus food directly from the producers, preventing potential waste at the start of the supply chain. According to 2023 data, 46% of the food sourced by Matsentralen originates from producers, as detailed in Figure 17 below.

Producers have a food waste to donation ratio of 3,3%, indicating that a relatively small proportion of the surplus food is successfully redirected to donations. This ratio highlights the opportunity for improving the efficiency of food donations from producers, as a significant amount of potential food donations may still be going to waste.

Retail stores

Retail stores often have unsold food close to expiration, due to failed forecasts or other logistical reasons. In 2023, only 1,9% of food from 51 stores was donated (see Figure 17). This is reflected in their food waste to donation ratio, which stands at just 0,2%. This low ratio indicates that only a small fraction of surplus food at the retail level is being redirected to donations, underscoring the need for improved strategies to increase food donations and reduce waste in this sector.

In interviews with retail store chains and GS1, the organisation responsible for developing and maintaining barcodes, it was revealed that discounting products close to expiration dates is an effective strategy for clearing out stock in retail stores. The ongoing rollout of 2D codes on food products, which will provide detailed product information, including expiration dates and inventory data, is expected to enhance the accuracy of forecasts, reduce surplus food and improve tracking, ordering precision and oversight of items nearing expiration, thereby helping to reduce food waste at the retail level. However, it was also noted that collecting small quantities of surplus food from various stores is not efficient for Matsentralen. Consequently, this study has not focused on retail stores, despite the considerable potential for increasing donations.

Category	Estimated food waste 2021	Donations 2023	Food waste to donation ratio
Wholesalers	5 880	2 766	47,0%
Producers	84 100	2 804	3,3%
Retail stores	62 475	118	0,2%

(Figures in tonnes)

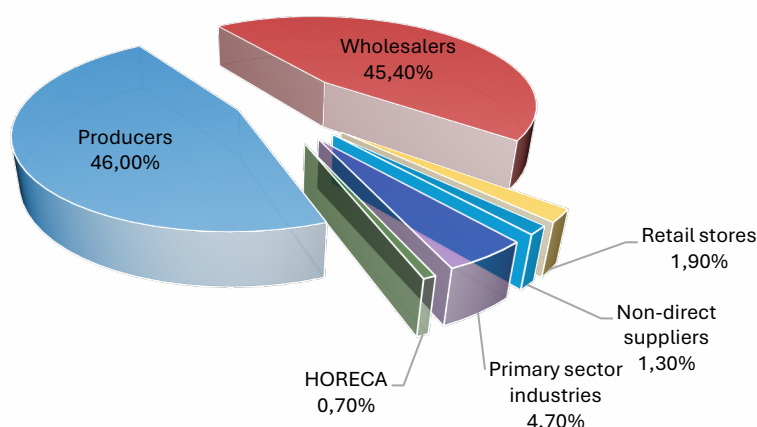
Figure 16: Food waste to donation ratio

Estimated food waste with 2021 figures. Source: Food waste Report p. 39-40

Donations 2023. Source: Matsentralen, see appendix 8

For a detailed overview of numbers of donors, their classification, share of total donations and changes in donation compared to 2023, see Appendix 8 – Donor data.

The collected food is strategically redistributed through Matsentralen to various charitable organisations. These organisations deliver the food to recipients who need it most, completing the supply chain. This model allows Matsentralen to tap into different stages of the food distribution network, maximising the potential to rescue food and minimise waste at multiple points of the supply chain.



HORECA - Hotels, restaurants and cantinas

Non-direct suppliers - Suppliers not directly related to the food industry, e.g. charitable organisations or music festivals, who donate food

Total donations (2023) = 6000 tonnes

Figure 17: Origin of food donations

4.4.3 Bottlenecks

In examining Matsentralen's supply chain, the issue of bottlenecks was considered, focusing on capacity-constrained resources whose limited availability restricts the organisation's ability to meet product volume, mix, or demand fluctuations required by the marketplace (Krajewski & Malhotra, 2022, p. 241). Several bottlenecks were discovered throughout Matsentralen's supply chain that can hinder its efficiency. Challenges include the timely collection of surplus food from various points in the supply chain. Efficient coordination of transportation and logistics is essential to swiftly collect surplus food and prevent potential waste. Additionally, robust communication across the supply chain is crucial; -delays or

inaccuracies in information about food surpluses can result in significant inefficiencies and hinder timely redistribution. Late notifications, especially on Friday evenings without prior notice, create bottlenecks due to limited volunteer availability and inefficient weekend communication, hindering quick food collection and redistribution.

5 Solutions, innovations and structural changes

This chapter presents a series of proposed solutions to improve food redistribution for Matsentralen. The focus is on addressing the primary challenges identified throughout the project, including reducing food waste, increasing food donations, and enhancing the overall efficiency of the distribution process. These solutions are designed to ensure a more sustainable and effective food donation system by leveraging innovative approaches and structural adjustments.

5.1 Proposed Solutions

This section outlines the solutions created to optimise Matsentralen's food redistribution processes. These solutions address the main barriers and aligns with opportunities to food donations identified through the stakeholder interviews, offering practical and innovative approaches to enhance operational efficiency. The subsections below provide an overview of the eight solutions, highlighting their potential to streamline operations and increase food donations to Matsentralen.

5.1.1 Centralised Food Auction Service

Setting up a digital centralised auction marketplace is seen as an effective tool for minimising food waste. In this platform wholesalers and producers, the primary donors, can list their available surplus food items. This provides a centralised overview of available food and allows interested parties, including discount sellers, charitable organisations such as Matsentralen, and organisations converting food to other products, to bid accordingly. If the highest bidder cannot collect the food or requires specific storage conditions, the food can be offered to the next highest bidder or donated directly to Matsentralen at no cost. Although Matsentralen's bid will have a monetary value of zero, they will be able to collect food quickly using their in-house logistics. As such, the food donor will experience a positive financial effect in terms of freeing up cooler/freezer/warehouse capacity. This will also allow donors to prioritise Matsentralen if they consider this to be advantageous in terms of positive public relations. In scenarios where Matsentralen cannot accept the food due to logistical constraints or short use-by dates, the food provider might have to divert the food further down the waste hierarchy - possibly as animal feed, compost or energy recovery. This centralised system ensures that all participants have real-time access to food

availability, enabling quick and efficient decision-making and optimising the food redistribution process, see Figure 18 below.

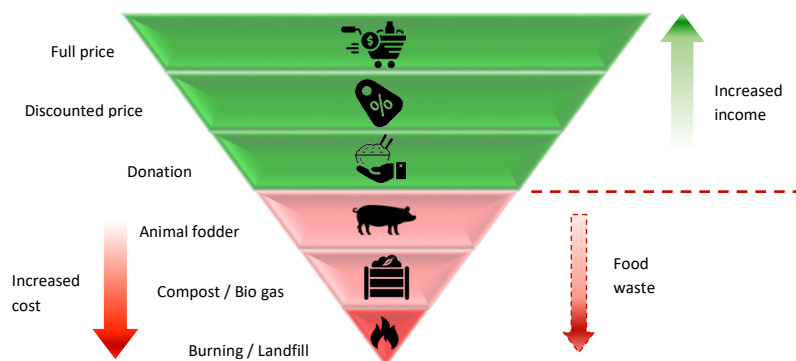


Figure 18: Food waste hierarchy

5.1.2 Integration with Digital Freight Labelling

Integrating Digital Freight Labelling (DFL) into Matsentralen's operations offers an innovative solution to optimise the flow of goods from wholesalers to Matsentralen. By replicating the efficient processes already used between producers and wholesalers, this approach enhances predictability and planning for Matsentralen. The wholesalers have control over what they have in store, and they have statistics and data on their operations. They can notify Matsentralen in advance that they have a specific product that will most likely be donated within a certain period. Similarly to the way producers send a DFL to wholesalers, wholesalers can send a DFL to Matsentralen, providing details of the type and quantity of products they will likely donate. This advance notice allows Matsentralen to better prepare to receive and process donations in an efficient manner. Matsentralen can optimise their logistics and required transportation size in terms of freezer, cooler and dry goods transport capacity. This will reduce the randomness of individual work. Matsentralen can freeze products that are close to their expiration date to extend their expiration date, utilising this solution to help plan what to distribute as fresh food and what to freeze. These products can also be used in Matsentralen's Kitchens in Oslo and Stavanger.

This system enables Matsentralen to plan volunteer schedules, reducing the reliance on last-minute arrangements. With a clear overview of incoming donations, they can more effectively allocate volunteer resources, ensuring smoother operations and minimising the unpredictability commonly associated with food redistribution and the risk of having to turn down food from donors.

5.1.3 Sorting technology

Several technological solutions could improve the efficiency of food donation, specifically by improving the capacity and skills of the recipients of donated food.

Tunable, a company initially specialising in gas detection in ships, is currently working with BAMA, a Norwegian supplier of fruit and vegetables, to develop a 'Digital nose' (shown in Figure 20) that can detect the gases produced by produce as they ripen and decay. This is achieved through a process known as Molecular vision, whereby nanotechnology and infrared spectroscopy are combined and used to analyse gases emitted by fresh produce. Through this process, it is possible to detect if produce is ripe enough to eat, edible, or no longer suitable for consumption.

Although each foodstuff has a unique spectral distribution, (see Figure 19) it is possible to use a single detection unit for a wide range of produce, as the produce it is analysing can be selected on the unit, upon which the device is configured accordingly.

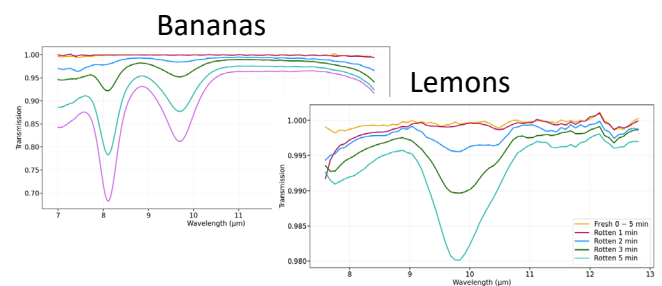


Figure 19: Unique spectral distributions of fresh produce



Figure 20: A portable 'Digital nose' for analysing the freshness of fresh produce, designed by Tunable

The 'Digital nose' is handheld, approximately the size of three mobile phones stacked on top of each other, and thus very mobile (see Figure 20). It is also very simple to use, requiring little training, and is therefore eminently suitable for Matsentralen's purpose.

Currently, devices have a high unit cost (Approximately NOK 100 000), and a long analysis period (Approximately 90s). When commercially launched during the second half of 2024, the unit cost is anticipated to be approximately NOK 10 000, combined with a significantly shorter analysis period.

As a 'Digital nose' analyses gases emanating from fresh produce, it does not require the produce to be unpacked or presented in a specific manner. The produce can remain in its packaging, enabling the user of the device to analyse large amounts of produce quickly. This is a significant advantage compared to other automated solutions for estimating the freshness of produce, which utilise cameras and hyperspectral imaging to evaluate the produce. This requires significantly more expensive and bulky equipment, and also that produce is laid out on a conveyor belt or similar to be assessed. Thus, hyperspectral imaging is not a realistic option for Matsentralen.

The use of a 'Digital nose' would not only represent increased efficiency for Matsentralen, but it could also improve donors' confidence in Matsentralen, as they would safely know that Matsentralen was capable of effectively removing any produce that did not meet specified requirements. A significant source of fresh produce waste is discarding an entire shipment if part of it is bad. The donor does not have time to find and remove the produce

that is not suitable for human consumption, and therefore chooses to throw away the entire shipment, as they do not want to risk the reputational damage associated with end users receiving sub-quality food.

5.1.4 Optimisation of logistics

Key logistical barriers to food donation are related to (1) the distance between producers, wholesalers, and Matsentralen in rural areas, (2) a lack of structured scheduling of optimal timing for collecting goods from suppliers and (3) redistribution of donated food between Matsentralen's eight divisions. To address these challenges, optimising logistics through structured coordination of deliveries and pickups is proposed. By implementing a logistics system, Matsentralen can streamline the transportation process, ensuring that food donations are collected efficiently and cost-effectively. This system would include real-time tracking, route optimization, and a centralized scheduling platform to coordinate pickups from multiple donors and redistribute food donations between Matsentralen's divisions.

Optimisation of logistics also applies to utilising producer and wholesaler truck capacity as they deliver to their customers. Many trucks often have spare capacity that Matsentralen could employ to redistribute food between their divisions. In rural areas, these trucks could bring food donations to the divisions they pass by on their routes instead of discarding the food. Optimizing logistics and making the logistics known centrally in the same manner as in The Food Auction Service and The Digital Goods Flow will further enhance the efficiency and effectiveness of food distribution efforts.

This approach will minimise transportation costs, reduce food waste, and ensure that donated food reaches those in need more promptly.

5.1.5 Capacity and expertise of wholesalers

One practical solution to enhance food donation efficiency at Matsentralen is collaborating with producers and wholesalers who can handle specific tasks and possess the relevant tools, such as meat cutting and packing machinery. Rather than investing in these capabilities internally at Matsentralen, leveraging the expertise and infrastructure already in place within the wholesaler network is more efficient. This collaboration would involve compensating producers and wholesalers performing these tasks, ensuring that they are fairly paid for their work while optimising the flow of food donations to Matsentralen. By outsourcing specific tasks, Matsentralen can focus on its core operations while benefiting from processed and ready-to-distribute food donations.

5.1.6 Performance indicators

One effective solution to drive the food donation process is to raise awareness among employees at Matsentralen's suppliers about the impact of their efforts in reducing food waste. By utilising visual tools such as screens or digital displays, companies can show real-time data on the quantity of food waste being reduced through donations. This transparency can motivate employees by making them more conscious of their contribution

to the company's sustainability goals and the broader impact of their actions. Increased awareness can lead to a stronger donation culture and foster a greater commitment to minimising waste, ultimately resulting in more consistent and increased food donations.

Moreover, when employees see the direct results of their efforts in monetary terms, such as tracking the amount of food donated, it reinforces a sense of purpose and responsibility within the organisation. This creates a positive feedback loop, where increased visibility into their impact encourages further engagement in food donation efforts. Over time, utilising the progress principle (Stoknes, 2024b) to create a culture of awareness can deepen the organization's commitment to sustainability and food redistribution, leading to even greater outcomes in terms of reduced waste and enhanced contributions to initiatives like Matsentralen.

Furthermore, Matsentralen could provide suppliers with detailed reports of their food donations. Currently, many suppliers do not track how much they donate, nor do they distinguish between donations and disposals in their reporting, as both are often classified as losses. By offering donation-specific reports, Matsentralen could help suppliers clearly separate and track their positive contributions, allowing them to see the impact of their donations versus waste disposal.

Additionally, Matsentralen could explore the potential to monetize this reporting service by offering these donation analytics to suppliers, providing them with valuable insights into their sustainability efforts in a similar manner the reporting offered by Foodmesh described in section 4.3.3 above. These reports could be used not only for internal performance metrics but also as a tool to promote their corporate responsibility initiatives. While Matsentralen currently provides these figures free of charge (excluding CO2 metrics), there is an opportunity to position this data as a valuable service that enhances suppliers' ability to showcase their contributions to reducing food waste and improving social impact.

5.1.7 Communication and Awareness about Matsentralen

A key solution to increasing food donations to Matsentralen lies in the development of a targeted communication and awareness program, combined with a focus on enhancing operational capacity. Matsentralen has identified limited awareness within the food sector as a major barrier to growth. This lack of visibility inhibits their ability to attract more donations and build long-term partnerships with key stakeholders.

The proposed program would aim to transform relationships with potential donors into sustainable partnerships by positioning Matsentralen as a trusted expert in food redistribution. By highlighting their successes in reducing food waste and promoting their impact on the community, Matsentralen can build trust and foster more active engagement from the food sector. A strategic communication effort that leverages social media, public relations, and collaborations with influential partners will help elevate Matsentralen's profile, boost its brand recognition and ultimately attract more donations. Furthermore, this

initiative could benefit from the pro bono support of a communication agency as part of their corporate social responsibility efforts or from private funding. However, increasing food donations requires more than just enhanced visibility—it necessitates improving Matsentralen's expertise and operational capacity. Despite recent expansions, such as moving to a larger facility at Ensjø in 2023 to address logistical constraints, stakeholders like R10 have expressed concerns regarding Matsentralen's ability to effectively manage large-scale donations. This hesitation stems from fears about reputational risks associated with donations not being handled properly.

To overcome these concerns, Matsentralen must proactively demonstrate their operational capabilities and adherence to industry standards. Sharing success stories, providing transparency about quality control processes, and engaging in open dialogues with stakeholders are essential to showcasing their ability to efficiently process donations, even those of mixed quality. By building this trust, Matsentralen can assure companies like R10 that they are fully capable of handling donations, ensuring that only items of satisfactory quality are distributed.

Integrating these communication- and capacity-building efforts will not only enhance food donations, but also strengthen partnerships within the industry. This holistic approach will reduce food waste, strengthen Matsentralen's reputation as a leader in food redistribution, and ensure a steady flow of quality donations to meet the needs of the community.

During the conversations with CEO Per Christian Rålm at Matsentralen, he gave us an additional task:

5.1.7.1. How can Matsentralen increase public awareness of their work?

In addition to the solutions already proposed in this section, a framework is aimed at equipping Matsentralen to take a clear leadership role in mobilising engagement and fostering collaboration among stakeholders within the food sector to increase food donations. With its resources, independent stance, industry connections, and strong commitment to tackling food waste, Matsentralen is well-positioned to lead this effort. These initiatives, combined with the communication and awareness program, will significantly enhance the public awareness and reputation of Matsentralen within the sector.

A framework for mobilizing engagement and driving change, based on research on successful organisations, has been identified to guide this process (Stoknes, 2024c). It includes six key tools that Matsentralen can leverage:

1. Creating high-quality connections with its stakeholders by inviting to regular World Café-workshops ('World Cafe Method', 2015) to discuss topics related to food donations. This format encourages small group discussions, where participants share ideas and explore solutions in a relaxed, café-like setting.

2. Leverage generative resistance to food donations among the stakeholders. Instead of avoiding criticism or negativity, Matsentralen should actively seek out and acknowledge resistance, using it as an opportunity for discovery, creativity and relationship building.
3. Create collective meaning-making. By adopting a Triple Bottom Line approach - considering financial, social and ecological benefits equally - stakeholders can gain a deeper commitment to the cause. World Café meetings offer a platform for these discussions, helping participants understand the broader impact of their efforts beyond financial profit.
4. Focusing on giving behaviour through contributing to others. This approach creates collaboration, expands networks and encourages innovation, leading to more effective food donation strategies.
5. Create a sense of agency by empowering stakeholders to take ownership of their roles in reducing food waste, fostering proactive engagement and commitment.
6. The progress principle - Celebrating small wins and progress can motivate and sustain efforts. By sharing success stories and milestones, Matsentralen can inspire creativity and engagement among its stakeholders.

See Appendix Appendix 9 - Mobilising Engagement to Change - for a more detailed description of this framework. By applying these tools, Matsentralen can drive innovation, enhance collaboration and foster accountability, leading to more effective food donation processes and a greater impact on reducing food waste. Ultimately, this will also increase public awareness of Matsentralen.

This set of six tools for mobilising engagement has only been briefly touched upon in this section. Therefore, the project team is willing to visit Matsentralen to explain the framework in detail and assist with its implementation.

5.1.8 Legislative and Financial Incentives

To address the issue of financial incentives for food donation, relevant legislation must be changed in order to not only reward food donation further, but also to penalise industry members that do not donate, e.g. by implementing a Pigouvian tax similar to that imposed on industries who pollute the environment as a by-product of their business (Beatty et al., 2007; Sandmo, 2006, p. 23). This would contribute towards internalising the negative externalities of food waste and ultimately move towards a Nash equilibrium, where each participant maximises their payout against the strategy chosen by the other (Samuelson et al., 2022a, p. 298). It would be disadvantageous not to donate food, while food destruction would only be financially viable in the event food donation is not possible. As a result of this, one would observe a Pareto improvement (Samuelson et al., 2022b, p. 221), where Matsentralen would be better off if the level of food donation is increased, without an increase in food waste. An example of such measures could be to eliminate tax deductions on food that has been destroyed, thereby significantly discouraging this practise.

There are currently no specific guidelines on how to justify the gift element related to food donations, making it difficult to calculate and predict related tax deduction elements. Thus, it is clear that in order to encourage food donation, current tax law must be clarified on this topic by the tax authorities. Furthermore, relevant laws should be altered to encourage food donation instead of food destruction.

5.2 Solution Criteria

Ten solution criteria were defined in collaboration with Matsentralen. These criteria are:

1.	Efficiency of collection:	How well the solution can streamline the donation process.
2.	Quality preservation:	Maintaining food quality during transportation and donation.
3.	Scalability	The system's ability to scale up to handle increased volume with minimal additional cost or complexity.
4.	Integration with existing systems	Compatibility with systems used by other actors in the food sector.
5.	Cost effectiveness	Consideration of initial investment, ongoing operational costs, cost improvements from efficiency, and net benefit to all parties (at least no net loss).
6.	Data analytics and reporting	Results-oriented data analysis and reporting.
7.	User friendliness	Ease of use for all involved parties.
8.	Compliance and standards	Ensuring the solution meets regulatory requirements.
9.	Support and maintenance	Has ongoing support and maintenance to meet user needs.
10.	Impact	The solution's effectiveness in increasing donations to Matsentralen.

Evaluating potential solutions against these criteria ensures they effectively address the barriers identified in section 4.1. Each criterion has been analysed in a weighted decision matrix, as detailed in section 5.4 below. This structured approach is helpful in selecting solutions that are aligned with the goal of reducing food waste by increasing food donations.

5.3 Solution Scenario Rating

In order to determine which solutions are the most robust and therefore relevant for further analysis in a weighted decision matrix, all eight proposed solutions are reviewed against each scenario as outlined in section 3.4.2. Each solution was scored in terms of robustness against the four scenarios, - compliance, proactive, status quo and collaborations. The four most robust solutions in each of the scenarios were then chosen

and subsequently further analysed in a weighted decision matrix. These four solutions are as follows:

- 1. Centralized Food Auction Service**
- 2. Integration with Digital Freight Labelling**
- 3. Optimisation of Logistics**
- 4. Legislative changes - Tax incentives**

Details of the rating and ranking of the eight solutions in each scenario is outlined in Appendix 5 - Solution listing and scenario robustness score.

5.4 Weighted Decision Matrix

The four solutions selected through the scenario rating process as described in section 5.3, were evaluated using a weighted decision matrix, where each solution was ranked in a weighted criteria matrix (Brereton, 2022). Although all criteria are important, they were prioritised according to their relevance to the problem statement. Totals for each criterion were calculated by multiplying the weighting of the criterion by the corresponding value for each rating. Below is the ranking of the solutions, with number 1 scoring the highest and number 4 the lowest:

- 1. Legislative changes - Tax incentives**
- 2. Optimisation of Logistics**
- 3. Integration with Digital Freight Labelling (DFL)**
- 4. Centralized Food Auction Service**

Detailed information on the criteria, weightings, and the complete decision matrix can be seen in Appendix 6.

Matsentralen can enhance its operations by implementing all four proposed solutions. While the Legislative changes - Tax incentive solution is recommended as the first step due to its substantial potential to increase food donations across various sectors, the other solutions are also valuable and complementary, each addressing different aspects of the food donation process. When considering the timeline for each solution, the Legislative Change - Tax Incentive is likely to take more time to implement. However, Matsentralen can simultaneously start working on the other three solutions while progressing with the legislative change. The following is an overview of each solution and its role in the overall strategy:

1. Legislative Changes - Tax Incentive: This solution ranked the highest because it offers broad impact by encouraging food donations through financial incentives. By making it more attractive for businesses to donate surplus food, this approach directly increases food donations and has the potential to create a substantial, lasting reduction in food waste. If

the government prioritises clarifying or changing tax legislation without delay, this solution will significantly contribute to achieving the SDG 12.3 target by 2030.

2. Optimization of Logistics: Improving logistics is crucial to overcoming key barriers, such as the distance between donors and Matsentralen, and the need for better coordination of deliveries. By streamlining transportation and making use of underutilised capacity in supplier trucks, this solution can reduce costs and ensure that donated food is distributed more efficiently across Matsentralen's divisions.

3. DFL: Incorporating DFL into Matsentralen's operations enhances the predictability and planning of food donations. This solution allows for advance notification of incoming goods, helping Matsentralen better prepare and allocate resources, thus reducing unpredictability and ensuring more effective distribution.

4. Centralized Food Auction Service: Although it ranked lowest, the Centralized Auction Service introduces an innovative way to acquire surplus food. It could contribute to reducing food waste by enabling a proactive approach to food acquisition.

6 Discussion and Recommendation

The analyses, findings and proposed solutions have identified several areas for further discussion. The following sections will address the Legislative change – Tax Incentives. Additionally, advocacy for the Food Waste Committee's proposed measure to revise the Industry Agreement, alongside implementing legislation on food waste, will be presented. These structural changes will result in a stronger commitment from management, which when combined will lead to increased food donations.

6.1 Financial incentives

The study of food surplus management revealed that current financial incentives from tax legislation lack differentiation according to the industry resource pyramid (See Figure 3: Matvett's resource pyramid in section 2.7), potentially overlooking opportunities for more sustainable practices. In contrast, the horizontal scan revealed that countries like Lithuania actively incentivise food donations through tax relief, encouraging businesses to redirect surplus food away from landfills, biogas and animal food.

In Norway, tax regulations uphold the principle that donated food retains a significant value, as food suitable for human consumption is considered valuable, whereas destroyed food is classified as having no value. However, defining food as having no value allows a more significant financial loss to be recorded. This has the unfortunate effect of promoting food destruction over food donation and leads us to question why incentives are not more favourably structured to prioritise human consumption over less sustainable disposal methods.

The discussions with stakeholders in the food sector have highlighted a substantial lack of knowledge regarding tax regulations related to financial incentives for food donations. Businesses must navigate Norwegian tax legislation proactively and leverage tax benefits to enhance financial efficiency. However, during the interviews, it became clear that many stakeholders find the tax legislation complex and challenging to understand, leading to an under-utilisation of available benefits. For example, R11 mentioned, "We have not utilised tax benefits for food donations because we were unaware of such possibilities." Supporting this, a tax lawyer from NHO noted, "Current tax law lacks specific provisions for food donations, relying instead on general tax rules. There are no clear guidelines from the Ministry of Finance or the Tax Ministry on this matter, creating uncertainty in its application." These findings indicate a crucial need for more precise communication and simplification of relevant tax legislations to enable businesses to fully utilise incentives for food donations effectively.

To bridge this knowledge gap, the development and dissemination of clear tax guidelines detailing tax benefits related to food donation are recommended. Clarifying taxation regulations would equip businesses with the necessary information to make decisions that are both economically advantageous and socially responsible. In addition to simplifying relevant tax law to make it more easily understood and utilised, specific tax laws must be amended to actively promote food donation over food destruction. This could include, but should not be limited to, allowing tax deductions on the full value of donated food while removing tax deductions related to food destruction and costs associated with this. Current tax law operates counterproductively, limiting tax deductions for donated food while offering significantly greater deductions for food that is destroyed.

Structuring financial incentives to align with the industry resource pyramid illustrated in section 2.7, would further enhance management's commitment to food donations, leading to more consistent and efficient practices. This approach could alleviate inconsistencies in management commitment, often resulting in sporadic and inefficient donation activities.

The findings indicate that inconsistent management commitment is a significant barrier to effective food donations. Enhancing financial incentives for donations could strengthen management engagement, fostering more uniform and effective organisational practices around food donations. Ultimately, the sporadic and inefficient donation activities currently observed could be significantly reduced by addressing this inconsistency.

Concerns about potential reputational damage were identified, deterring businesses from donating food due to fears of distributing products that might not align with their brand's quality and safety standards. Improved financial incentives could motivate decision-makers to address this barrier, potentially increasing food donations, especially if tax deductions related to food destruction are eliminated.

Despite a general willingness to donate food, the study underscores the need for Norway to refine its financial incentives for food donations to better align with the industry resource pyramid. Norway's incentives remain unclear and underutilised due to complex tax regulations. Advocating for the development of clear tax guidelines that simplify and elucidate the benefits of food donations is essential, as this could potentially increase business engagement and consistency in food donation practices.

6.2 The Industry Agreement and Regulatory Proposals

Reflecting on the discussions surrounding the Industry Agreement, it is evident that while the agreement set ambitious goals when it was signed in 2017, its impact has been limited. The Norwegian government's commissioning of a comprehensive Food Waste Report, presented in January 2023, highlights these shortcomings and signals an urgent need for stronger, enforceable measures. The paradox of this governmental action lies in the fact that the public sector remains excluded from the current Industry Agreement— a gap that needs to be addressed.

It is crucial to understand why, despite its good intentions, the Industry Agreement has failed to drive substantial reductions in food waste. The absence of mandatory enforcement, combined with the agreement's voluntary nature, has likely contributed to its limited effectiveness.

The Food Waste Report emphasises that while the voluntary Industry Agreement is useful in establishing initial collaboration across sectors, it is insufficient to achieve the scale of food waste reduction required to meet SDG target 12.3 by 2030. The call for legal frameworks, including the introduction of a due diligence obligation and mandatory food donation requirements, marks a structural change from voluntary agreements to binding legislation that goes beyond the members of the agreement. This proposed legislation will require all businesses to not only be aware of the impact of their operations on food waste, but also to take proactive, measurable steps to mitigate these. This structural change from a voluntary to a regulated framework creates a stronger accountability mechanism, ensuring that the goals set forth in the Industry Agreement are no longer just aspirational but are actively enforced across both private and public sectors.

By strengthening the Industry Agreement through mandatory due diligence assessments, businesses and public entities will be legally required to implement best practices for reducing food waste. These assessments will ensure that all parties are held accountable for their roles in the food supply chain, whether they are in production, retail, or public sector institutions like hospitals and schools. Moreover, the introduction of standardised reporting requirements under this legislation will ensure greater transparency. This regulatory enhancement will enable accurate tracking of food waste reduction progress, facilitating the identification of areas where additional interventions are needed.

While the Industry Agreement has established a foundation for collaboration on food waste reduction, it is no longer enough. It must evolve to meet the demands of the proposed legislation. Many stakeholders expressed not only readiness for this shift but also active support for it. The proposed legislation will further obligate management to commit fully to implementing and maintaining effective food donation and food waste reduction practices. The fusion of voluntary agreements with binding legislation is not just helpful – it is critical to achieving the significant, measurable impact required to meet the 2030 goals.

6.3 Management Commitment

Committed leadership was found to play a pivotal role in the success of food donation programs. Effective management ensures that the organisation promotes and implements food donation practices through clearly articulated policies and actionable strategies. For example, the data from Matsentralen reveals a notable correlation: 3% of suppliers who contributed 66% of the total donations in 2023 also demonstrated a strong commitment to food donation at management level. This combination of financial incentives for food donation and mandatory due diligence assessments on food waste as discussed in the two previous sections, will ensure commitment to food donation among management across a wider range of organisations, driving substantial progress in reducing food waste.

The interviews highlighted two contrasting examples of management commitment. R8 serves as an example of effective leadership in food donation. Their leadership has systematically integrated food donation into their operational agenda, setting clear targets for waste reduction and establishing rigorous metrics for tracking progress. This approach ensures that food donation is a consistent and predictable part of their operations rather than a sporadic effort.

On the other hand, R11, despite a solid outward commitment to food donation, illustrates the pitfalls of a lack of structured management. While their leadership vocally supports food donation, lacking specific targets and follow-up mechanisms results in erratic and ineffective donation practices. R11's enthusiasm for promoting food donation has significant potential benefits. It enhances consumer relationships by aligning the company's practices with growing consumer expectations for corporate responsibility. This public commitment can also elevate corporate value by positioning the company as a leader in sustainability efforts, which can attract socially conscious investors and customers. However, despite these benefits, the lack of tangible results due to the absence of a structured approach underlines the need for concrete actions and accountability. This example demonstrates that while willingness is an important start, without robust systems and clear goals, it falls short of achieving sustained impact. R11 stated: "Currently, our processes for food donation are poorly managed. We lack defined processes and criteria for how donations should be handled, which often leaves the decision to individuals. We urgently need to address this

lack of structure to ensure more consistent food donations.” This candid admission from R11 emphasises the critical need to establish clear guidelines and responsibilities within companies to capitalise on their commitment to reducing food waste through donations.

It might seem sufficient for companies to outwardly continue supporting food waste reduction, as exemplified by R11. However, consumers are increasingly discerning and unlikely to be misled over the long term—raising concerns about potential greenwashing, whereby companies make themselves appear more environmentally friendly than they are (Vlahov, 2024). Consumer trust can erode if corporate sustainability efforts are perceived as superficial.

Moreover, following the Food Waste Committee's recent report to the Parliament, which includes recommendations on documenting how donations function within companies, legislative proposals and revisions to the Industry Agreement are anticipated in the near future. This makes a strong case for companies to proactively establish and embed robust food donation practices within their operational frameworks now rather than reacting to regulatory changes later.

Another compelling reason from an employee perspective involves the morale and motivation within production and distribution roles. Witnessing the products they produce being discarded can be demotivating. Conversely, knowing their efforts contribute to feeding those in need can enhance job satisfaction and loyalty to the company (Stoknes, 2020).

To remain proactive and forward-thinking, businesses are encouraged to prioritise developing robust routines and a strong leadership commitment to food donation initiatives. By doing so, companies not only align themselves with potential upcoming regulatory changes but also foster a positive internal culture. Such commitment enhances brand authenticity, significantly improving consumer perceptions and boosting employee intrinsic motivation. Establishing these practices now will equip businesses to seamlessly integrate the upcoming regulatory requirements and maintain their competitive edge in sustainability efforts.

7 Conclusion

PROBLEM STATEMENT

Which technological systems, innovation and/or structural changes can help streamline donation processes and ensure the delivery of quality products from producers and wholesalers to Matsentralen to minimise food waste?

The study has focused on identifying technological systems, innovations and structural changes that can streamline donation processes and ensure the delivery of quality products from producers and wholesalers to Matsentralen as well as minimising food waste. The key findings and recommendations aim to enhance the efficiency of food donations and directly address the initial problem statement.

It was discovered that the current financial incentives do not adequately support the industry's resource pyramid, significantly hampering the promotion of sustainable practices. To rectify this, structural changes are necessary in order to make food donation more viable and appealing than food destruction. This shift requires an overhaul of existing frameworks to better align with environmental and social governance goals.

Moreover, the research has illuminated a profound knowledge gap regarding the tax benefits associated with food donations. The complexity and lack of clarity in existing tax laws pose a formidable barrier, preventing stakeholders from fully utilising potential benefits. This issue necessitates clear, accessible tax guidelines detailing the benefits of food donations, making it easier for businesses to engage in socially responsible, economically sound practices.

To this end, specific amendments to tax laws are recommended to encourage food donations over disposal. The proposals include allowing full-value tax deductions for donated food and eliminating tax deductions for food that is destroyed, along with the costs associated with food destruction. Such measures would not only simplify the tax system but also align financial incentives with sustainable practices, prioritising donation of food for human consumption over food waste. This strategic focus supports the essential human right to food and the need for more efficient food distribution systems to aid those in need. In this context, the fusion of a strengthened Industry Agreement with binding food waste legislation as proposed by the Food Waste Committee, is not just helpful, but critical to achieve the SDG 12.3 target.

By addressing this key area, food donation processes can be significantly advanced while financial incentives are aligned with sustainability goals, ultimately ensuring that Matsentralen can operate more effectively. These changes will directly contribute to reducing food waste in line with contemporary environmental objectives, marking a substantial leap forward together with the Food Waste Report's recommendations.

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8 Abbreviations

CEAP - Circular Economic Action Plan

DFL – Digital Freight Labelling

DLF - Grocery Supplier Association (Dagligvare Leverandørenes Forening)

DMF -Norwegian Grocery Trade Environmental Forum (Dagligvarehandelens MiljøFond)

EEA - European Economic Area

EFTA - European Free Trade Association

FEBA - European association of food banks (Fédération Européenne des Banques Alimentaires)

FSFS – European Comission Framework for Sustainable Food Systems

GS1 - Global Standards 1 organisation

KS – Kommunesektorens Organisasjon (Norwegian association of local and regional authorities)

NHO - Confederation of Norwegian Enterprise (Næringslivets Hovedorganisasjon)

SDG – United Nations Sustainable Development Goal

WFD – EU Waste Framework Directive

9 Use of ChatGPT

While writing this assignment, the authors have utilised ChatGPT, an artificial intelligence-powered large language model, as a resource. ChatGPT has played a role in rephrasing and structuring certain texts.

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11 Appendices

Appendix 1 - Stakeholder List

Organization	Name	Title/Description
DMF	Harald A. Kalvøy	Chair of Board DMF and Head of Food Security and Preparedness at REMA 1000
DMF	Knut Lutnæs	Sustainability Committee DMF and Senior Advisor, Communication and Public Relations at Coop Norge
REMA Distribusjon	Synnøve Berg	Director of Responsibility and Sustainability at REMA Distribusjon (RD)
Coop Distribusjon	Roger Nyeng	Director of Logistics Coop and Board member in DMF
Coop Norge	Bjørn Sørland	Head of Best Practices at Coop Norge
REMA 1000	Emilie Våge	Head of Social Responsibility and sustainability, Board member at Matsentralen and member of the DMF Sustainability Committee
NorgesGruppen	Halvard Hauer	Environmental Chief Specialist and member of the Sustainability Committee in DMF
Mesterbakeren	Per Ole Arneberg	Quality Director
Fatland	Ole Malvin Knutsen	CEO
BAMA	Bent Barman Skaare	Environmental Director
Kavli/Q-Meieriene	Camilla Baustad	Project manager Climate in the Kavli/Q-Meieriene
Matsentralen Norge	Per Christian Rålm	CEO
GS1	Terje Menkerud	Senior advisor Data capture
Tunable	Tharindu Madduma Hewage	Business Development Manager
FoodMesh	Megan Czerpak	Head of Communications
Matvett	Anne-Grete Haugen	CEO and Board member at Matsentralen
Bio gas producer	Anonymous	Procurement Manager
NHO advokat	Anonymous	
Norsk Gjenvinning	Anonymous	
Coop Norge SA	Lena Røstad	Manager, Coop financial department

Appendix 2 - Interview guide

Consultancy Project: Reducing food waste by food donation – Matsentralen

This guide serves as a prompt and reminder of the essential topics to cover, questions to ask and areas to investigate during interviews. It is designed to be simple and easy to follow, allowing the primary focus to remain on the stakeholder.

Booking the interview

- Always call to book the interview to establish a good connection from the start.
- Aim to arrange an in-person meeting if possible.
- Briefly introduce the problem statement and the sponsor during the phone call.
- Aim to schedule a one-hour interview if possible.
- Send a follow-up email confirming the booked time, including details of who the interviewee will meet and the questions that will be asked.
- Remember to add the “CP Introduction” document in the follow-up email.
- Ensure clarity and transparency in the email to make the interviewee feel comfortable and prepared.

Conducting the interview

- Greet the interviewee and thank them for their time.
- Reintroduce yourself and briefly restate the purpose of the interview.
- Reassure confidentiality and obtain consent to record the interview.
- Ensure a high-quality connection by giving full attention to the interviewee. Put away phones and PCs to avoid distractions.
- Make sure the interviewee introduces themselves, including their name, role and involvement with Matsentralen.
- Here are the main questions the interviewee should answer. However, remember to allow room for them to add any information they think is important for the subject:
 - What are the environmental ambitions and goals of the company?
 - How does the company currently address the issue of excess food produce?
 - Is surplus food donated? If so, how is this implemented?
 - How much focus does food donation currently receive from the management team of the company?
 - How does the company plan to improve the efficiency of the food donation process? What will this require, and what are the largest barriers?
 - What does the company think of the proposed measures described in the Food Waste Report? Which of these are most relevant for addressing the food waste problem?
 - What is the view of the company regarding the proposed due diligence requirements in the Food Waste Report?

Closing:

- Invite the interviewee to share any additional thoughts or insights.
- Ask if they have any questions for you.
- Thank the interviewee again for their time and valuable contributions.
- Provide information on how they can contact you if they have any follow-up questions or additional thoughts.
- Ask for permission to contact them in the event of follow-up questions

Appendix 3 – Scenario Planning analysis

Driving Force	Predetermined/Uncertain
*Legal requirements	Uncertain
*Supplier collaboration/engagement/ commitment	Uncertain
Transportation and logistics efficiency, systems and routines	Uncertain
Innovation	Uncertain
Macroeconomy (i.e. consumer spending power)	Predetermined
Funding for Matsentralen	Uncertain
Environmental education and awareness	Uncertain
Social education and awareness	Uncertain
Volunteer capacity	Uncertain
Supply chain awareness	Uncertain
Financial requirements	Uncertain
Data availability	Uncertain
Reputation and consumer choices	Predetermined

Identified driving forces and their categorisations.

Appendix 4 – Scenario narratives

	Implications	Options
“Compliance”	-Self-preservation and isolation -Strengthens linear supply chain -Reduced innovation -Reduced collaboration -Culture of compliance	-Engage with government -Intensify engagement efforts -Show the financial value in change
“Status Quo”	-Very little change -Program continues but does not improve -Could trigger government intervention later	-Focus on options with incentives for industry to engage -Intensify engagement efforts
“Proactive”	-Compliance culture -Little innovation because meeting requirements is taking all resources (or innovation is not accepted) -Risk of loss of engagement with sector	-Work toward industry/government collaboration rather than conflict -Communicate benefits of self-direction and innovation to government to open the door for sector
“Collaboration”	-Continuous improvement of programs -Sustainability in self-driven systems and results -Risk of loss of engagement with sector	-Maintenance of positive reinforcement between government and sector -High degree of information sharing for continuous improvement

Scenario implications and options

Appendix 5 - Solution listing and scenario robustness score

Solution	Scenario Matrix Fit
Centralized Food Auction Service	– Fits well in collaboration – Might increase engagement to move suppliers to – Good solution regardless of legislative requirements – If requirements are strict it may be used more actively – As long requirements as strict as saying “who has to take what where” then the marketplace may be additional – Food auction may be the result of the legislation – Food auction can be adapted to fit regulatory models – Good demonstration of due diligence by suppliers – Robustness score: 4/4
Integration with Digital Freight Labelling	– If Matsentralen does this then they can link into the existing supply chain processes. – Doesn't required a lot of supplier engagement (they are already using this) - just Matsentralen – Doesn't really matter what the legislative requirements are. They are already utilizing data and barcodes with or without legislation. – Robust because it requires full engagement to function and leverage. – Robustness score 4/4
Technological Solutions	– Requires a high degree of supplier engagement. They will have to trust that Matsentralen has the capacity or skills to select good and bad food. Reputational concerns. – Also requires engagement in that it depends on the supplier must get the food to Matsentralen in the first place. – Needs more supplier engagement than EFL. – Would fit in collaboration and proactive. – Legislative requirements being stricter could help this solution be more successful. That means if the food bank gets a lot more, they can turn it away with proof. – Robustness score 3/4
Optimization of Logistics	– If logistics were better supplier engagement may increase. They would have more positive feelings about the donation process as it would be easier for them. Therefore, it could be a good solution if engagement is low and improves because of this solution. Addresses low engagement. – If engagement is high then this will still work but may have less impact.

	– If legislative requirements for waste get very strict, this logistics solution will support an economical and practical way to implement stricter legislative requirements. – Highly robust – Robustness score: 4/4
Utilize the Capacity and Expertise of Wholesalers	– For scenario plan: – Will need high supplier engagement for this to work. Which also require investment and change in business processes. – Degree of severity of legislation and alternative penalty will determine if this solution will be viable for the sector. – Robustness score: 2.5/4
Performance Indicators	– For scenario plan: – Would require high engagement. Appeals to altruistic side of the business. WE did more - so what? – Good regardless of legislative requirements prove compliance or help government report. – Robustness score: 3/4
Communication and Awareness Program	– For scenario plan: – If you already have good engagement, do you really need it? Anywhere on the left side of the matrix you will need it to increase engagement. – Robustness score: 2/4
Legislative Change (Tax incentives)	– If engagement is low and there is improved financial incentive, then this is a great solution (money talks) – If there is good engagement, then you are rewarding that good behaviour and maintaining that engagement. – If legislative requirements are low, it will not matter if this is implemented. If they are high, it will be complimentary. – Robustness score: 4/4

Appendix 6 - Weighted decision matrix

Criteria	Weighting	Centralized Auction		Implementation of electronic Freight Labeling		Optimization of Logistics		Tax Incentives	
		Rating	Total	Rating	Total	Rating	Total	Rating	Total
Efficiency of Collection	2	1	2	3	6	4	8	2	4
Preservation of Quality	3	3	9	2	6	4	12	1	3
Scalability	3	3	9	1	3	2	6	4	12
Integration with Existing Systems	2	1	2	3	6	2	4	4	8
Cost Effectiveness	1	1	1	3	3	2	2	4	4
Data Analytics and Reporting	2	3	6	2	4	4	8	1	2
User Friendliness	2	2	4	4	8	1	2	3	6
Compliance and Standards	2	1	2	3	6	2	4	4	8
Support and Maintenance	1	1	1	3	3	2	2	4	4
Increases Impact	4	3	12	1	4	2	8	4	16
		Total 48		Total 49		Total 56		Total 67	

Totals for each criterion were calculated by multiplying the weighting of the criterion by its corresponding rating.

Appendix 7 - Financial modelling of food donation and destruction

VAT

	Ex-VAT purchase price	VAT Outgoing	Total purchase price	Market value	Adjusted market value	Goods value	VAT incoming
	(Paid by the producer/store)	(VAT Paid to supplier = Innkommende MVA)	(Ex-VAT price + VAT)	(Purchase price + 5% margin)	(Markdown according to discount rate, often 40%)	(Value of goods at time of donation / destruction)	(VAT paid by end customer = Utgående MVA)
DONATION	17,39	2,61	20,00	21,00	12,60	12,60	0,00
DESTRUCTION (Bio gas)	17,39	2,61	20,00	21,00	12,60	0,00	0,00
DESTRUCTION (Animal fodder)	17,39	2,61	20,00	21,00	12,60	2,00	0,00

Income tax

Tax payable/deductible on profit/loss	Tax refund	Cost of disposal	Tax deduction related to Cost of disposal	Income related to destruction
(Income tax is payable on profits, ie. Sales price - Purchase price. In case of a loss, a corresponding tax deduction may be claimed.)	(=22% of purchase price when destroyed)	(Cost per kg of disposing of food as animal fodder / bio gas / landfill, less tax deduction of cost of disposal)	(=22% of cost of disposal)	(In the case of animal fodder, the producer of animal fodder pays for the received food, meaning the producer/store has an income related to food destruction)
-1,05	0	0	0	0
-3,83	3,83	1,25	0,28	0
-3,39	3,83	0	0,00	1,78

	Total tax deductibles	Costs	Income	Tax deductibles - costs + income
	(Tax deductibles related to loss and processing costs)			(=Total "Income")
DONATION	1,05	0,00	0,00	1,05
DESTRUCTION (Bio gas)	4,10	0,98	0,00	3,13
DESTRUCTION (Animal fodder)	3,39	0,00	1,78	5,17

Assumptions

For the purposes of these calculations, the following assumptions have been made:

-The gift element related to donation is 40%, meaning that only the remaining 60% may be booked as a financial loss and subsequently the subject of income tax reduction. Depending on how relevant tax laws are interpreted, a gift element may in reality be defined as anywhere between 0% and 100, with corresponding impact on related income tax deduction. *As such, the ambiguity of the relevant tax law is a significant barrier to food donation*

-All parties are aware of relevant tax laws and utilise these optimally. Based on stakeholder interviews, this is not realistic in practice, as several have admitted to not being aware of tax deductions related to food donation, further excacerbating the issue of food donation being less financially favourable than food destruction.

Numerical constants

Margin	5 %	Tax rate	22 %
Discount rate	40 %	Approximate disposal cost per kg (Bio gas)	1,25
VAT rate	15 %	Income per kg for food processed as animal fodder	1

Comments -VAT

In the case of food donation and food destruction, VAT is a zero sum game, as VAT Outgoing is reclaimed in all three scenarios. Similarly, VAT Incoming is not payable in any of the three scenarios, due to legislation exempting food donation form being subject to VAT.

Comments -Income tax

Tax refund is highest for destruction, specifically related to bio gas, as a tax refund is due on the destroyed food and the costs associated with conversion to bio gas

Appendix 8 – Donor data

Received donation YTD 2024

Donor classification	Donation (Tonnes)	Share of total donations	Change comp. to 2023	# active donors	Share of active donors	Change comp. to 2023
Producer	2804	46.0%	-3.3% 	154	46.0%	14.9% 
Wholesaler	2766	45.4%	11.8 	53	15.8%	1.9% 
Primary sector	288	4.7%	48.6 	16	4.8%	14.3% 
Store	118	1.9%	-31.5 	51	15.2%	64.5% 
Others	78	1.3%	78.8 	43	12.8%	95.5% 
HORECA	43	0.7%	21.8 	29	8.7%	0.0%
Total	6097			346		

Appendix 9 - Mobilising Engagement to Change

Research completed in conjunction with this paper indicates a significant lack of awareness about Matsentralen's expertise, resources, and capabilities within the food sector. This shortfall hinders innovation, stalls collaboration, and leads to suboptimal outcomes in efforts to increase food donations, often resulting in a "blame game" where accountability is avoided rather than addressed. To tackle this challenge, it is recommended to develop a targeted marketing and communications program for Matsentralen, as previously mentioned.

Additionally, it is suggested that Matsentralen take a clear leadership role in mobilizing engagement and fostering collaboration among stakeholders within the food sector to increase food donations. This process should create opportunities for stakeholders to raise, examine, and resolve issues related to food donations. Matsentralen is well-positioned to facilitate and lead this effort, given its resources, independent stance, industry connections, and strong commitment to tackling food waste. As a result of these efforts, alongside the marketing and communication program, Matsentralen's visibility and reputation within the sector will be significantly enhanced.

A framework for mobilizing engagement and driving change, based on research on successful organizations, has been identified to guide this process. It includes six key tools that Matsentralen can leverage: high-quality connections, generative resistance, meaning-making, giving behavior, agency, and the progress principle (Stoknes, 2024c). This framework can be employed to raise awareness of Matsentralen's capabilities and emphasize the critical role of food donations in reducing waste. By applying this framework, Matsentralen can drive innovation, enhance collaboration, and foster accountability, ultimately leading to more effective food donation processes and a greater impact on reducing food waste.

In the following sections, the implementation of this framework is briefly outlined, highlighting specific strategies Matsentralen can use to maximise its impact and strengthen its leadership in reducing food waste through improved food donation processes.

1. Creating High-Quality Connections

Engaging in this challenging work requires all parties on the supply chain to interact and collaborate to reduce food waste. The functionality of the process depends on high-quality connections, enlivened by people who create positive collective outcomes (Dutton & Heaphy, 2003).

Matsentralen should develop a strategy to reach out and develop high-quality connections with key stakeholders in the food sector. A "World Café" style workshop could be conducted regularly to discuss topics related to food waste. The basic components of the World Café methodology consist of: (1) Creating an informal setting resembling a café with small round

tables (2) The host which would be Matsentralen, welcomes participants, introduces the process, sets the context, shares the World Café etiquette, and ensures everyone is comfortable. (3) Conversations occur in three or more twenty-minute rounds with groups of four to five people. Participants switch tables after each round, with the option to leave a "table host" behind to brief the new group. (4) Each round begins with a specially crafted question tailored to the event's context and purpose. Questions can remain the same across rounds or build upon each other. (5) Each round begins with a specially crafted question tailored to the event's context and purpose. Questions can remain the same across rounds or build upon each other ('World Cafe Method', 2015).

A broad range of individuals from the food sector should be personally invited to participate at Matsentralen's regular Word Café meetings. Conversations should be based on Dutton's foundations for respectful engagement (Dutton & Heaphy, 2003) which include being genuine, actively listening, and conveying presence. Educating some dedicated volunteers with strong self-awareness as facilitators of the World Café meetings is essential. This education should cover key facilitation skills, such as active listening, posing questions, and time management.

Connections built in this phase will lay the foundation for future communication and engagement. These connections must be continually understood, monitored, and developed.

2. Generative Resistance

The research of Luo and Lu points out that "a cooperative rather than competitive approach to conflict can create more effective performance (2020). Resistance and criticism or negativity about situations, ideas, or process can be a source of discovery and value creation as well as an opportunity for relationship building by ensuring people feel heard. Successful iterations of generative resistance will also create a safe environment to raise concerns or doubts and generate solutions.

In Matsentralen's communications with the food sector network, including at World Café meetings, it is recommended that resistance is identified, acknowledged, and even sought out in the process. This can often stimulate thoughtful consideration and creativity and generate good solutions and approaches (Nemeth, 1995). Initial interviews with the sector identified strong competition among the actors in the food sector. These competitive differences could be identified and used generatively in the process. A goal to "ensure habits of deep sparring" (Stoknes, 2024c) will assist in developing a culture of embracing resistance and groups working openly together. To ensure that resistance remains respectful, it is recommended that parties collectively develop a "code of conduct" for providing feedback. This will allow everyone to be honest and direct while ensuring that feedback remains constructive.

3. Meaning Making

Finding meaning in the process of reducing food waste through food donations is crucial for engagement and motivation within the food sector. The Triple Bottom Line approach, which includes financial, social, and ecological aspects, can help frame the importance of these efforts. However, it is essential to challenge the assumption that profit is the primary goal of business. By emphasizing the social and ecological benefits equally with financial ones, stakeholders in the food sector can find deeper meaning and commitment to the cause. This approach encourages a more holistic view of success, fostering greater collaboration and innovation in the fight against food waste (Stoknes, 2024a).

The Word Café meetings provide a good platform for discussing and collaboratively creating meaning around the issue of food waste reduction through food donation. These meetings can help stakeholders explore and internalise the broader impact of their efforts beyond financial gains, highlighting the social and ecological benefits. Through guided conversations and shared insights, participants can develop a shared understanding and commitment to food donation, thus enhancing their motivation and engagement. If Matsentralen can activate this collective meaning-making process that aligns with the primary goal of the Industry Agreement and the SDG 12.3 target, it can drive more effective and sustained action towards increasing the amount of food donations.

4. Giving Behaviour

Having a giving behaviour, characterized by an emphasis on contributing to others, is a crucial component in creating a collaborative and supportive environment. For Matsentralen, adopting and promoting giving behaviour can significantly enhance its efforts in mobilizing engagement to change within the food sector and addressing the challenge of food waste through food donations. Giving behaviour expands networks, enhances knowledge sharing, and creates a safe environment for innovation. Givers have access to diverse resources and foster collaboration, leading to more effective food donation strategies. Their approach encourages safe experimentation, resulting in innovative solutions and new perspectives (Stoknes, 2024a). Additionally, givers better understand and meet the needs of stakeholders, improving communication and partnerships. Encouraging help-seeking and normalising it within the food sector can create a culture where asking for assistance is both expected and accepted. Matsentralen should focus on providing meaningful and sustained support to its stakeholders. By embedding giving behaviour into its organizational culture, Matsentralen can enhance its collaborative efforts, improve engagement, and effectively tackle the food waste challenge.

5. Creating a sense of Agency

To increase food donations from the food sector, Matsentralen can leverage the concept of agency to cultivate proactive engagement and commitment among stakeholders. By

empowering them to take ownership of their roles in reducing food waste, Matsentralen can inspire more consistent and meaningful contributions to food donation efforts.

6. The Progress Principle

The progress principle emphasises the importance of experiencing progress in one's work as a key driver of creativity, motivation, and sustained effort. Experiencing progress in work is a significant source of motivation. It encourages individuals to accept difficult challenges, face setbacks, and persist longer. Recognizing and celebrating small wins and milestones can ignite joy, engagement, and creativity among Matsentralen's team and stakeholders. To implement the progress principle effectively, Matsentralen should focus on several key strategies. Sharing stories of success and mastery in sustainability efforts can establish a culture of recognition and motivation. This could involve sharing stories regularly on Matsentralen's social media and webpage.

Implementing this approach will help Matsentralen by increasing awareness of its capabilities, fostering stronger collaboration with stakeholders, and improving the efficiency of food donation processes. This will enhance Matsentralen's reputation, attract more consistent contributions, and ultimately increase its impact on reducing food waste.