

DESIGN AS A TOOL TO REDUCE FOOD WASTE: PRESENTATION OF SALVAGE FOOD IN GROCERY STORES

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ABSTRACT

The global issue of food waste affects us all. Measures to reduce food waste have been introduced at various places, but there is still a need for development of new strategies. How grocery stores present their salvage food and the measures taken to sell the products vary. This master project in product design aims to draw connections between the customer experience in grocery stores in relation to salvage food and a reduction in food waste, an angle which is yet to be thoroughly investigated. The results of observations and interviews have been shared and discussed. The findings suggest several measures grocery stores could implement, which may lead to a reduction in food waste. Further studies on the topic in collaboration with grocery stores, customers and designers would be beneficial.

Keywords: Grocery store, food waste, customer experience, design education

1 INTRODUCTION: ISSUES OF FOOD WASTE

Food waste is a global issue. By removing produce from the food chain, resources used for production, such as water, land, energy, and more are wasted. The importance of a circular economy comes to light when seeing how food waste increases global emissions and world hunger [1]. In June 2017, Norwegian authorities and the food industry settled on an agreement to reduce half of the food waste in Norway by 2030 [2]. While grocery stores account for 15% of the Norwegian food waste, households are responsible for 55% [3]. Most of the food related household waste is bought in grocery stores. This gives grocery stores opportunity and power to influence the customers and their behavior pattern. By increasing awareness and building knowledge about the issue, grocery stores could possibly contribute to the reduction of food waste.

2 BACKGROUNDS: REDUCTION OF FOOD WASTE IN GROCERY STORES

In this study, *salvage food* is used to represent grocery store products that have passed their expiration date, are out of assortment, have damaged packaging or are otherwise unfit for sale. Is it possible to salvage these products from being wasted? While Norwegian authorities and the food industry are defining goals and working towards them, there is a lack of research related to how grocery stores can present salvage food to reduce food waste and create awareness. Related existing studies are based on how grocery stores can reduce packaging, plastics and similar waste. The focus area of this study will be how stores choose to display salvage food. By understanding how to influence consumer behavior, grocery stores can use design to reduce food waste. Current research shows that consumers who think food waste is immoral, waste less food [4] and the most common strategy used to reduce food waste in grocery stores is price reduction [5]. Some stores also donate their surplus to charity organizations. Products with reduced prices are displayed differently in various grocery store chains, but we do not know which approach is the most efficient to influence consumer food waste behavior. By combining this knowledge, grocery stores could aim to influence consumers to reach their goals of waste reduction, which leads to the research question; *How can grocery stores improve the salvage food customer journey?*

3 METHODOLOGIES: A QUALITATIVE APPROACH IN RESEARCH DESIGN

3.1 Literature review

The database Web of Science was used as the primary source for literature findings. Keywords such as ‘Food waste behavior’ and ‘Food waste grocery stores’ were used. The article written by Horos and Ruppenthal [5], follows a qualitative approach. The data is of importance to understand the perspective of German grocery store owners, providing valuable knowledge to the research. The article investigates and explores the stores’ strategies, challenges and practices to prevent and reduce food waste.

The article by Misiak, Kruger, Kruger and Sorokowsk [4], is based on both quantitative and qualitative data. It is a psychological study with 562 participants. The study contributes with input to the customer behavior in relation to morality and food waste. It indicates that people judging food waste as unethical due to environmental- and socio-ethical issues, waste less. The findings are interesting as it may imply that increased awareness and knowledge on food waste may lead to changed behavior.

Other studies and research show that values influence behavior, and more so if the value is of significance to the person. As environmental issues become more important, values are affected and thus persons’ behavior. Values can be the root cause of an individual’s goals. If these goals are of importance, attention on actions will increase, which has been explored through a master thesis by Bruchfeld and Lind [8]. The articles were selected due to their different focus area, which has been a contribution to each end of the chosen research question.

The book by Wakinson [6] has been used to broaden the understanding of expectations set by customers and how to use this knowledge to fulfil these expectations to improve the customer journey. Furthermore, the book by Leavy [7] has been used as the main source behind research methods and approaches used throughout this study.

3.2 Methods of study & ethical considerations

To investigate how grocery stores display salvage food, field visits with a naturalistic approach have been conducted. The mentioned approach is unstructured, focusing on observing unplanned behavior in a natural, unaffected environment. Observation is beneficial to understand the customer experience and may give input to how the presentation can improve. In Lillestrøm, a town part of the Oslo metropolitan area, grocery stores of different retail houses were visited in order to uncover variations. The stores were; Coop Obs, Kiwi, Rema1000, and Meny. The customer experience journey was mapped to create an overview of the experience. Interviews were conducted with a narrow pool of only two customers as a test case and experimentation for further study.

Results from the observations were shared with the customers in a qualitative method of an in-depth, open-ended interview, see table 1. Information from customers is essential to understand their thoughts and experiences which is valuable to the research. Questions regarding food waste, salvage food presentations, experiences and expectations in stores were asked. Examples on questions asked are, ‘What are your thoughts and expectations regarding salvage food from grocery stores?’ and ‘What do you think about the salvage food section in your local grocery store?’. Ethical considerations are of importance when conducting an interview. The interviewees will therefore be anonymised and only relevant information to the research topic has been included [7] as well as generalized information regarding age, gender, income, and children. Medium income is based on the average salary in Norway.

Table 1. The interviewees

Person	Gender	Age	Income	Children
1	Male	20-30	Medium	No children
2	Female	60-70	High	No children under 18

4 FINDINGS

4.1 Understanding the customer

Research shows that customers are affected by the store environment [9]. Layout of quality design in a store is an important factor to consider when creating a pleasant shopping experience. This includes

cleanliness, lighting, and structure in terms of wide aisles, tangibility, well-marked directions and signs. Another element for satisfaction is the experienced value of the bought food, where pricing is the key factor and should in most cases reflect the value. Watkinson presents ten principles vital for positive customer experiences in his book [6]. The principles relevant to this study are experiences which are stress free, indulge the senses, consider emotions, and meet the expectations of the customers. I have mapped measures and goals to find an overview of important aspects of a customer journey through a store, based on the principles of creating a positive customer experience [6], see table 2.

The table shows three phases of the customer experience journey and factors and actions that could influence it. The first point being awareness, which captures how the customers are made aware of salvage food. Second, goals for the customer experience in terms of consideration and deciding to buy the products, and last, how to facilitate satisfaction and loyalty, making sure the customers want to keep buying salvage food. Examples of measures to increase awareness could be to have visible signs, easy access and making the section visually pleasing, for example by keeping it clean and structured. Furthermore, after being aware of the salvage food section, the customer is in the phase of consideration and decision making. It is natural to compare the products' value with the fresh food available. Pricing is an important tool to convince the customer. Other important factors are clear information and to target the identity of the customers. The last phase of the journey is related to loyalty and satisfaction. Considering these as goals, and fulfilling them, increases the probability of customers coming back. As shown in table 2, expectations are one key factor. What the customers expect of the food need to correspond with the actual experience. An example would be that the food should still be edible when buying it. Emotions should also be mentioned, as customers wanting to contribute to less food waste could achieve a sense of satisfaction after making the decision to purchase. Stores could also consider giving the customers the possibility to give feedback post purchase, both before leaving the store or at home for customer clubs registering the purchase digitally. The feedback should be thoroughly followed upon.

Table 2. Three phases of the customer experience journey by Maja W. Soleng

	Awareness	Consideration & decision	Loyalty & satisfaction
Measures & goals	<ul style="list-style-type: none"> • Ads • Visible signs • Accessibility • Visually pleasing • Indulge senses 	<ul style="list-style-type: none"> • Comparison • Pricing • Planning • Information • Stress free • Identity 	<ul style="list-style-type: none"> • Expectations • Customer service, social aspect • Emotions • Feedback & follow-up

4.2 Expectations and measures to raise awareness

When visiting the mentioned Norwegian grocery stores, their inventory and the construction of the stores were observed. The stores followed a similar pattern giving the customers resembling experiences when stepping inside. The section of vegetables presents itself first, while the cashier is at the end meeting the customers before they leave the store. The way customers interact in stores may not differ much, however, their experiences and planning before grocery shopping will vary. Stores have potential to nudge people to think about salvage food before shopping, through advertisement, coupons, and customer clubs. Using these methods to present salvage food and create awareness about food waste issues was not observed nor experienced throughout this research study in any of the store chains mentioned. When addressing food waste to explore the interviewees' awareness of the topic, both thought of food waste as bad, but for different reasons. Person 1 mentioned energy waste and world hunger while person 2 thought of other environmental issues, but added that she tries to act sustainably, when given the choice. While both had their opinions about food waste, they mainly bought salvage food due to price reduction to save money. While the price is important, several factors could be considered.

When discussing important factors to raise awareness and increase interest to buy salvage food in stores, different measures were mentioned. The interviewees expressed that the salvage section should be easy to find with clear signs. German grocery store owners have shared their thoughts on how to avoid food waste [5]. The store owners emphasized that salvage food placed so that customers know exactly where

to find it, has been successful. The interviewees assessed the same, mentioning that structure, organized food and cleanliness would feel more inviting. Person 1 expressed ‘If a grocery store gives the impression of not caring about its salvage food, it increases scepticism towards salvage food’, and continues by adding ‘I have seen trolleys filled with different products, which makes me not want to look. It is not my job to organize the produce’. On the other hand, person 2 did not mind, but stated that it would be easier if the products were sorted.

4.3 Store’s presentation of salvage food

Discussing the phase of consideration and decision making with the interviewees, being given the correct information as well as a high price reduction were mentioned as important. Person 2 pointed out, ‘I accept that the food looks less fresh, but I expect the taste to still be good’. Reduction of price seems to be the only direct action influencing the consumers. The most common measures to reduce food waste in Norwegian grocery stores, discovered through observations and stores’ online information channels, are reduction in price, food donations, apps as tools to notify expiration dates and similar [10]. An observation is that stores try to reduce food waste but have yet to give attention to how they present salvage food to customers. At Coop Obs, trolleys were used as troughs filled with products, placed around the store. There seems to be a lack of structure, other than similar products sharing the same trolley. Kiwi and Rema1000 had the same solutions, but with only one trolley in the store. This could be related to the size of the stores, as Coop Obs has more products being the largest store visited. Figure 1 is an illustration from Coop Obs. Meny had the section for out of assortment-food and food related to expiration separated. The former was on a shelf by the cashier with a clear sign, while the latter in a corner after vegetables, fruit and refrigerated food. No signs or information about the contents of the shelf were seen, other than a red sticker with the reduced price in percentage points, and the produce had not been organized. Figure 4 shows how Meny presented their food. The local stores used by the interviewees were visited and each had a section for salvage food. The stores used trolleys and a fridge trough. The first interviewee, person 1, had not bought salvage food in his local store and mentioned that he did not believe a section for it existed. He added that he would check the selections each time if he knew about it. Person 2 was aware of the section in her local store and informed that she used it quite often. This enhances the possible lack of a store’s regard towards the awareness phase inside the store but could also vary based on where the customers’ put their attention in grocery stores.

Discussing loyalty and satisfaction, the interviewees were both specific about their needs and expectations. Trust in regard to the food being edible was the most important aspect. Person 2 communicated this clearly, ‘If I end up buying rotten food, I will not take that risk again. Trust is important’. This is an important aspect of the customer journey, where the main responsibility lies with the stores.

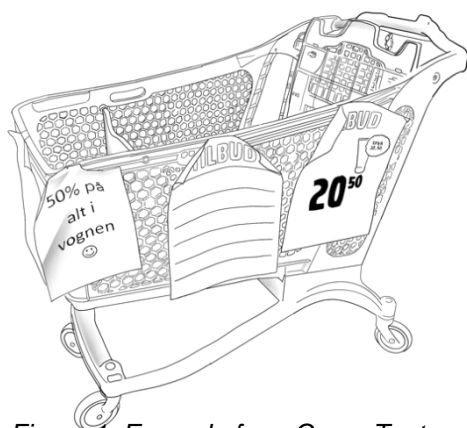


Figure 1. Example from Coop. Text translation: ‘50% on everything in the trolley’



Figure 2. Example from Meny. Text translation: ‘Drink & enjoy’

5 DISCUSSIONS: COLLABORATION WITH CUSTOMERS

The findings show the potential grocery stores have to reduce food waste. Society has become more aware of this issue, which affects how people judge food waste behavior. Knowing that such morals cause people to waste less [4], stores could put more focus in influencing persons’ awareness. The stores

giving customers the opportunity to help reduce food waste would speak to their values and identity, making it easier to use the salvage food section more often. The second interviewee substantiated this by saying that she tries to act sustainably if given the choice, as long as it is beneficial compared to new products. Creating awareness could be achieved through use of ads, visualizations with storytelling, clear information, and more. Additionally, as food waste is seen as a global issue, news, political measures and other external factors are also part of spreading information and raising awareness, which stores could benefit from. Having an inviting and visible section for salvage food could make it easier for the customers to consider and decide to buy. These actions and measures should be implemented thoroughly and preferably in collaboration with customers and designers. As Watkinson has made clear, customers should be in control without feeling pressured [6].

Through design education, designers have been taught to explore and represent the customer's needs and desires, which would be helpful to the contribution of achieving the goals of reducing food waste. The needs cannot be found without customer input. In this way, designers could help spread valuable information and increase awareness on the topic. Such a collaboration could also be presented as a project in participation with students in design education.

Interviewees expect some benefits when buying salvage food, such as price reduction, which was the main reason mentioned to buy salvage food. Continuing on using price reduction as a tool is crucial as the food still needs to mirror its value and to keep the interest of a wider range of customers. However, there are opportunities to increase the attractiveness of salvage food, in which creative minds of designers could contribute. How stores raise awareness and present themselves in relation to the topic of sustainability to customers could be included both pre and post purchase. The presentation of salvage food in grocery stores should be designed to visually appeal and be easy to detect [9]. The visual aesthetics are of significance since it presents food which is to be bought and eaten and therefore should look appetizing. Making the section easy to detect was brought to attention by the German grocery store owners, as this was important to their customers who used this section regularly [5]. The findings from this qualitative research approach indicate that design could be an important tool to reduce food waste in grocery stores. The small number of interviewees may limit the information available for the research study leaving the findings less diverse and conclusive. However, their voices represent some existing opinions in the society being important for the research.

6 CONCLUSION & FURTHER WORK

To reach the goal of reducing food waste in Norway by half, grocery stores have to take their part of the responsibility. Through a master project in product design education, this study has investigated how grocery stores can improve the salvage food customer journey to ultimately reduce food waste. While measures already are in place, such as food donations and price reduction, the findings revealed areas in which they can improve and explore. Mapping the three phases of the customer journey was helpful to address measures and compare them to the findings from observations and interviews. The measures discovered could be improvement in structure, visibility, trust, and visualization tools to increase awareness, which aligned with the map of the three phases of the customer journey. Feedback options as well as providing clear information and building a stronger identity which speaks to the customers could further contribute. A reduction in food waste is a potential outcome and a contribution to a circular economy, ensuring a food system that ideally does not create waste. Further research on the topic should be conducted. While the representation of different customers is narrow, it may give indications to topics of further study. It would be beneficial to have a quantitative study on customers and their behavior in stores related to the presentation of salvage food. Said study would broaden the understanding of the topic, especially when looking at presentations in relation to increased sales. Comparing the behavior of customers of different age, gender, income and with or without children would also be important, as their expectations and needs may vary. Communication between stores and customers pre and post purchase could be explored with the help from designers. Informing about food waste issues and how customers can contribute directly through the store could increase interest and lead to a change in behaviour. Getting the point of view from grocery store owners in Norway, as well as information on how changes affect the store financially and its employees, would also give valuable input to the research.

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