

Article

Drivers That Affect Households to Reduce Food Waste: A UK Qualitative Study

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Abstract: Individual households make significant contributions to food waste. Combating this waste would allow for better food distribution globally that can help combat global hunger. As there is currently a limited understanding as to why people waste food, we conducted semi-structured interviews with people that had taken part in a food waste reduction study, to explore drivers that contribute to reduced food waste within UK homes. Using a thematic analysis, four themes were identified based around the importance of thinking about food waste, having a flexible approach to food waste, as well as being emotionally engaged in food waste reduction processes. It was also explored if others have a role to play in whether people try to reduce their waste; however, contrary to previous findings, such a notion was not supported here. The implications of the findings are discussed.

Keywords: food waste reduction; households; cognition; social influence; subjective norms; emotions



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1. Introduction

Private households are key actors in food waste generation [1,2]. UNEP's Food Waste Index [3] estimates that around 931 million tons of food were wasted in 2019 and approximately 61% came from households. Furthermore, around 4.9 million tons of the food thrown away can still be safely eaten [4]. The seriousness of wasting food is obvious when considering that reductions could aid the development of a sustainable food system that can help combat global hunger [5]. It is therefore surprising that there is a limited understanding as to why food waste occurs within the home [6,7]. Hence, this paper sets out to explore drivers (here defined as factors that cause a specific behavior to take place or develop [8]) that can play a significant role in assisting others to reduce their food waste. We do so by using interviews that allow us to scrutinize what it is that makes people who attempt to reduce their food waste, want to and continue to reduce their food waste. By doing so, a deeper understanding is created for what drives people to reduce their food waste within households.

1.1. Drivers Affecting Household Food Waste

The causes of food waste are complex and often the result of multiple, interacting activities. In many cases, such behaviors are unrelated to food waste and are marked by both habitual and emotive underpinnings [9]. To date, a few reasons have been identified that can help to reduce food waste in households. For example, it has been suggested that a clear understanding of 'best before' and 'use by' dates can impact behaviors related to lowering food waste [10]. Other examples include, planning your meals before food shopping [11], feeling guilty [12], making use of proper storage to extend the useful life of food [13], and trying to increase the use of foods with cosmetic defects [14].

The most common strategies *actually* used to encourage reduced food waste within homes are the management of leftovers, size portioning, storage, and educational campaigns [15]. However, all these suggestions require that people have spare time to dedicate

to reducing food waste. For example, wanting to learn and engage in educational campaigns requires a person to take time out from something else to understand and study what needs to be done.

Time limitations usually lead to higher food waste, as people do not have time to think about how much they waste [16]. The lack of time also means that people often engage in cooking-related decisions with limited or no cognitive input [17]. This results in people making fast, simple, and repeat decisions, meaning that people are less likely to make extensive food preparation and, consequently, food items are left on the shelf until they go bad. Thus, cognition is likely to be an instrumental part in making people reduce their food waste. However, there is currently no understanding of whether people who are actively trying to reduce their waste also engage in more extensive thought processing, or whether it is more like a habitual behavior that requires little cognition.

1.2. Does It Matter What Others Think?

Studies have suggested that social norms (whether people engage, or not, in behaviors due to the perceived social pressure [18]) can shape human behavior. Social norms are commonly featured in the food waste literature. It has been found to play a role in sustainable behaviors such as whether students reduce their food waste in college campus canteens [19]. Furthermore, social norms can increase people's intent to separate household food waste [20], affect whether people recycle [21], and if they are willing to improve household waste sorting [22]. Social norms have even been linked to waste-preventing behaviors and the intention to reduce food waste in the Iranian population [23] as well as in young Spanish and Italian citizens [24]. Whilst norms can be influential in sustainable behaviors, it is not known if this is consistent in all cultures (such as the UK) and why this is important for food reduction behaviors.

The aforementioned research was used as a loose conceptual framework for the research conducted. Hence, factors such as extensive conscious thinking and what other people think of food waste were used as guidance for understanding food waste reduction behaviors. Whilst this informed and guided the thematic data analysis, the researchers also made use of an inductive approach to identify themes that can provide new insight into food waste reduction behaviors. This ensured that the extracted themes reflected both the previous literature and the participant's responses.

2. Materials and Methods

2.1. Participants

In total, eight participants, two men and six women were interviewed. There are multiple views on how many participants are needed to enable researchers to extract meaningful themes when conducting a thematic analysis [25–27]. Here, we followed Braun and Clarke's recommendation to use 6–10 participants for interviews [28].

The participants ages varied from 26 to 65 ($M = 44$). Five of the participants had a university degree, one had been educated to secondary school level and two had a post-graduate degree.

Four of the participants were married with children, one was married without children, two were in a relationship but had no children, and one was single. Consequently, the number of people in each household varied from 1 to 5.

Four of the participants lived in a city, two in a town and two in a village. The participants were also represented in terms of income difference. One was unemployed, two had an income below £15,000, three earned between £15,000 and 34,999, and one had an income of above £75,000. Thus, the participants were a suitable cross-sample representation of the participants that had taken part in the food waste reduction study, from which we recruited our sample.

The diverse sample means that the interviews represented a broader viewpoint and thus increased external validity.

All participants gave their informed consent before they participated in the study. This study was conducted in accordance with the Declaration of Helsinki and the British Psychological Society's code of conduct, and the study was approved by the University's Department of Psychology's Research Ethics Panel.

2.2. Measures

Semi-structured interviews were used to gather data, as they have been deemed a good tool for providing good first-hand descriptions of food waste practices [29]. Topic guides for semi-structured interviews with participants broadly covered 5 key areas: if engaging in a food waste study helps to reduce food waste; if food waste engagement trigger more conscious thought processes that lead to reduced food waste; the emotions involved in food waste; and whether others influence food waste. The questions asked were deliberately broad to encourage participants too freely speak about the potential factors affecting food waste and food waste reduction. Examples of questions included: Do you think about the amount of fruit and vegetables you waste?; What is your view of people that waste food?; Do you think that others care about food waste?; and Do you ever discuss food waste with others? (see Appendix A for all questions). Additional probes were also used to elicit more information as appropriate.

2.3. Procedures and Setting

Participants were recruited through a pool of participants that had taken part in a food reduction study, sponsored by WRAP, and thus had hands-on experience of trying to reduce their food waste. This was a suitable sample population, as we sought to understand real-life difficulties of engaging in food waste reduction, rather than a theoretical perspective.

All participants were interviewed online, using Teams, and interviews took between 30 min to an hour. The interviews were recorded and transcribed with the respondents' permission.

2.4. Analysis

A thematic content analysis was conducted on the interview transcripts. Both deductive and inductive approaches were used to explore themes that emerged directly from the data. We wanted to gain insight into whether peoples' drivers for reducing food waste could largely be underpinned by previous research findings. However, we also wanted the findings to be truly 'grounded in the data [30]' collected, and to have themes that genuinely represent the individuals interviewed, rather than only being deductively driven.

During the analysis, a thematic framework was developed to capture recurrent and underlying themes through a cyclical process [28,31]. Such cyclical processes consisted of reading, coding, and exploring the emerging patterns and content of the coded data. This was followed by a reflection and discussion. See Figure 1 for a visual model of the data analysis process. The iterative data analysis process meant that the transcripts needed to be reviewed many times.

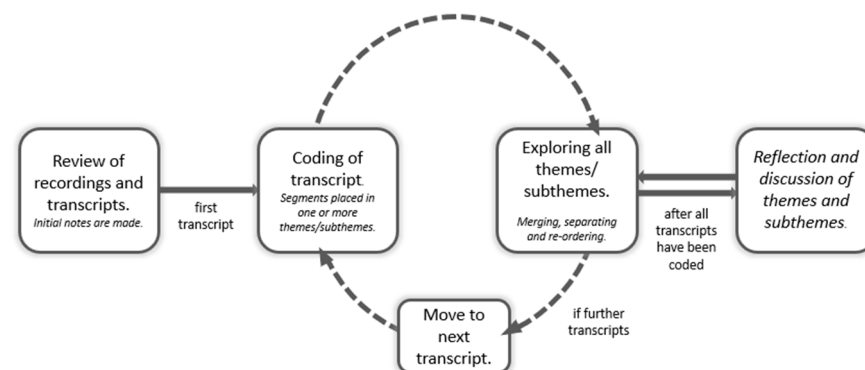


Figure 1. Data analysis process.

Following this cyclical process ensured that a hierarchical thematic framework was established, in which higher-order themes represented over-arching topics. This also informs the structure and content of the results section in this paper, in that the interview extracts that capture the main themes and sub-themes are presented.

3. Results and Discussion

Four themes were extracted, and thus the results are presented thematically in four parts. Firstly, we explore whether people think about the amount of food they waste. The second part examines how those involved in foodwaste reduction appears to be flexible in the way in which they go about it. The following two themes look at the emotional involvement and the social influence of others. Generally, the themes and experiences reported by our participants were congruent; however, we report differences in perspectives where they are found.

3.1. Thinking about Food Waste

Throughout the interviews, there were markers demonstrating that participants engaged in extensive thought processes concerning food waste. When directly asked if they think about the amount of fruit and vegetables they waste, their responses show that they know they cogitate on their food waste:

“Well, just... I think I always did...but I probably didn’t realize... how much I... I... did... No, I still don’t... think I waste an enormous amount as I try not to, but uhm... yeah...”

“Yes. I do. Uhm... And...I think about it more perhaps throughout the process, so I guess, if you count that as like, prevention, erm, I think about it a lot more now than during the start of the study.”

“Yeah, I do. So, I, like I said, I’m, I’m not a person that makes a lot of food and vegetables, but I think it it kind of made me realize that I’m wasting more than I realized. So yeah.”

The comments show that when people are already engaged in food waste reduction, they think about the process of reducing their waste. This is linked to having been part of a food waste reduction study as can be noted from the second quote. Some participants were even able to state how often and in what context their thoughts occurred:

“Probably... three-ish times a week, uhm, it’s normally just after like, dinner or lunch, so after I’ve eaten, and then if I’ve got leftovers. After I’ve prepared, and then after I’ve got leftovers. Uhm. It’s normally that time of the day, three or four times a week, uhm, I would think about...”

“Ehm... I would say every time I do my cooking because I do meal preps regularly. So, if you see from my diary as well, mainly Sundays are the waste times cause I do shopping on Saturday and then I put it on, start doing meal prep on Sundays, so maybe on mainly on Sundays I think about foodwaste more ‘cause that’s when I chop up my stuff and then bin the rest of the things. So maybe once a week I would say.”

Being able to state *when* they thought about food waste shows that they are consciously doing so, as they would otherwise be unlikely to be capable of stating when it happens. Moreover, the final quote also supports previous studies, in that their thinking process is intertwined with meal preparation and shopping [11,15]. However, it is not possible to state from the comment whether it is the preparation and shopping that leads to elaborative thinking or if it the thinking that is driving engagement in food preparation and shopping.

The fact that participants consciously thought about food waste seems to be beneficial for people, in that it also filters through into different food related behaviors, as noted from the following comments:

“Erm, it’s useful to think about what food I’m, I’m eating and also ... Throwing away, and throughout the... process... .ehm, throughout the process of the....”

erm. . . I've managed to look at ways perhaps . . . and then having wastage [inaudible]. . . as far as possible. I realize there are certain veg and fruits which I find erm, go off quicker, perhaps uhm, generally get a little. . . [inaudible] than others. . . erm try to find ways in which those [inaudible] stop happening."

" . . . [I] think a bit more and if I'd waste grapes, then the next time I'd buy a smaller pack of grapes, to see if it would be used up . . . So when I'm making my list, we always make a shopping list, I would think about it and I might make a note on my list to buy a smaller pack than normal if they haven't eaten it, or not to buy a particular fruit if we've wasted it the week before."

"Yes, I think that, I mean, not only the frequency of my foodwaste but also others in my household, err, but also whenever I've gone to like a restaurant and I see like left things, or . . . Err. . . you know, I, I, think about where that did go, it's likely just the bin. And. . . it could be used [inaudible]. It hasn't made me this massive eco-warrior, uhm, but it has made me more aware of little things that I can do to actually. . . you know. . . stop wastage. . ."

If simply taking part in a food waste study encourages further thinking, which leads to a reduction in food waste, it may be fruitful furthering the opportunities that people have to take part in small studies or similarly natured activities. This would not have to be on an individual household basis but could also be rolled out to organizations, such as schools, prisons, and hospitals. By doing so, a potentially larger reduction in food waste can be achieved.

The second quote also shows that the use of lists to plan what you are going to buy [11] is helpful as they think about how much fruit and vegetables they may use. Also aligned with previous research [10], is the following quote, as it shows that people think about when food items should be discarded, rather than just relying on the dates stated on the product:

"I throw stuff away when it's past its best, when it's rotting or you know, going over the top, overripe. I very rarely throw stuff away because I don't like it, or . . . because. . . you know. . . it's it's past the label on the packet, I don't take any notice of those."

As people are not simply looking to expiration dates to determine if food is usable, they are instead relying on their judgement, which indicates flexible thinking. Moreover, some comments suggest that flexible thinking about food waste leads to creativity. Such creativity manifests itself in that people think of new and innovative ways to deal with food, which make it more enjoyable. It was also expressed that creative aspects can be passed on to future generations, as can be seen in the following comments:

"I try to use up as much as I can, and before going shopping I will do a big cook off of anything that needs using up, and so dinners aren't necessarily 'oh I fancy this tonight'. Often, they are, but quite often it's what needs using otherwise it'll go off. That tends to be my first rather than what do I really fancy. And then it's made me more of an experimental cook, which is quite good fun."

"I think it's really important as we've got children. So, it's important to show them the importance of not wasting food and how, what you can do with leftovers and things."

The fact that people have an adaptable and flexible thinking approach to food waste is also evident from the second theme.

3.2. An Adaptable Approach to Food Waste

There is a pattern throughout the interviews, showing that waste reduction is linked to an aptitude for being flexible, and it seems to be driven by thinking extensively about how to do it. Changing how food waste is perceived is one step in the direction of reducing waste:

“...it is waste, rather than left over. That has a particular connotation to it. It’s waste. It feels like there is a lost potential. . . uhm so to speak.”

The comments also showed that actual behavioral adjustments took place, and this would have required them to think about how best to change.

“I have tried to waste less, uhm. . . in terms of fresh food I’ve actually. . . I’d say with my fruit, I’ve bought more frozen fruit, uhm, just that I can eat it as I need it, and you know, put it back in the freezer. And. . . in terms of veg, I don’t really like frozen as much, erm, so I like having fresh vegetables. Err. . . so I think it has changed elements of my shopping habits and I also like saving where I can do.”

Some participants looked for solutions in which the foods that would be wasted were used in other ways:

“I tend to buy reduced loaves when they’re 15p or whatever, so, I guess the mindset is then that if I waste the ends of this, financially it doesn’t. . . matter. I put it out for the birds, I don’t just chuck it in the bin.”

It was even found that participants were willing to think of ways of reducing food waste for loved ones, which is indicative of a creative thinking process:

“... my son and his wife waste vastly more food than I do. . . erm. . . eh. . . So, when I can see them throwing something away that I think oh I just. . . Sometimes I take it off them, and say give it to me I can use that for the birds or. . . you know, find a use for it, it may not be for myself but I don’t like to see them chucking perfectly good stuff away.”

The reported behavior changes are wide ranging, in that they do not only include practical changes such as substituting fresh fruit with frozen fruit, but also what can be done to save food that would inevitably be thrown away—such as feeding it to birds. Such thinking processes seem related to cognitive flexibility and innovation in changing how they thought about dealing with food waste.

3.3. Influence of Others

Mostly, participants agreed that there was not a great concern about what others think about their food waste. Hence, overall, it does not support the idea that intent and behaviors are influenced by subjective norms, and thus differs from findings in previous studies [18–24]. This is evident from the following comments:

“On a day to day, no, I don’t at all”

“Ehm, not particularly. No, ehm, that sort of goes against my own. . . I don’t particularly care what people think about me. . . I know that sounds. . . wrong but. . . I wouldn’t change my personal waste because of other’s people’s views about me.”

“ehm. . . No, not really.”

However, the last two responses are not resolutely expressed, which may reflect a lack of self-insight, and to some extent, uncertainty about whether their behaviors are affected by others. There were also two participants that were not in agreement with the others. One person said that:

“Yeah, I do. I mean, I do care about what other people think of me in general, but also about my waste because ehm . . . not mainly around people in the house, but people come to visit me and then maybe we’re cooking together. We have a a dinner on a Sunday and then they see me wasting food. I would just think what would they think of me? You know? Are they judging me? So, I would think that.”

The comment shows that what others think can be linked to broader concerns about whether they feel judged by others. The fact that they are worried about other people’s opinion therefore also manifests itself in their viewpoints about food waste. Hence, this may be more linked to the individual’s personality rather than showing a link between food waste and the importance of the influence of other people’s opinions. This could be explored

further, and an attempt to distinguish between different personality characteristics when measuring the impact of subjective norms on food waste would be useful. Such knowledge could be used when trying to persuade people to reduce food waste, as messages containing subjective norms could be targeted toward people with personalities that are perceptive to such messaging.

Another participant also showed concern that the judgement of others may lead to being perceived as a ‘food waster’:

“yeah you wouldn’t like to be known as somebody who wastes food. Yeah.”

At least partially, these comments appear anchored in the fact that the participants themselves perceive food wasters in a negative manner and thus are concerned about being perceived negatively. This became clear when asking participants what their view is of people that waste food. Characteristics such as not being thoughtful and selfish were used to describe food wasters:

“I feel that they’re not responsible enough, they’re not conscious.”

“in some ways it’s selfish and in some ways it’s not considerate. Uhm. And I think it’s a little foolish, especially from a financial standpoint. Why would you purchase stuff that you’re just going to dispose of?”

“I would think maybe they’re not thoughtful as much. They don’t care much about the environment, and I feel angry at them as well.”

The findings demonstrate that, predominantly, the sample was not affected by the thought of others. This is not aligned with other studies, where subjective norms have been found to influence sustainable behaviors [18–24]. Thus, these results cast some doubt on the applicability of subjective norms on people who are already engaged in the reduction of food waste. It could be that already reducing your food waste makes you feel confident and therefore find it easier to disregard the opinion of others. Another explanation for differences found here compared to previous studies [18–24] could be related to the fact that all the participants are based in the UK.

The final quote, include a highly emotive description of what the participant feels (in this case, angry). Strong emotions were consistently expressed throughout the interviews, as evidenced in the fourth theme.

3.4. Food Waste, an Emotional Affair?

A wide range of emotions, related to food waste, were articulated throughout the interviews. This was unexpected, as emotions linked to food waste reduction are not commonly reported in the literature.

One participant recognizes that wasting food can be a luxury and describes that such waste comes with feelings of sadness and guilt. Whilst another refers to guilt when putting food in the bin and anger for purchasing items that end up in the bin:

“I feel sad sometimes because quite often it’s things that things that are a bit of a luxury, like blueberries I won’t get round to it because I think I’m going to make something really special with that. So and so things are more likely to waste them because I never get around to making this special. [chuckles] But also, you know, guilty, obviously. Uhm. . . I don’t think guilt being guilty is useful about food because, you know, it’s just a part of our conditioning. I don’t think guilty is any good. But you know, it does happen.”

“I think I feel guilty about, you know, putting the foods in the bin because of, you know, how I I was raised as well, you know, not to waste food. And it’s because now it’s my household. I’m spending that money on food. I also feel kind of angry at myself to like, you know, why did you buy this? You didn’t need this. So maybe sometimes angry. Guilty. Ehm. . . maybe. . . I don’t know. . . regretful, sometimes? Because you can’t return [the items].”

In addition to using strong emotions (such as guilt and regret) to describe their relationship with food and waste, the second quote shows that some of these emotions may stem from childhood, such as feeling guilty. This supports previous findings that have identified guilt as an emotion that drives reduction in food waste [12]. The childhood association suggests that emotions attached to food waste can be more long lasting, something that is also evident from the following comment:

“we usually do our shopping on the weekend, so it’s quite safe to say that Friday and Saturday usually just about everything is fresh and as the week goes on, I start worrying about what’s starting to spoil.”

The quotes show a strong emotional connection between the participants and the topic of food waste. It is difficult to say whether this emotional attachment is based on having been engaged in a previous food waste reduction study or whether it is a connection that existed prior to having taken part. Nevertheless, it reveals that emotions may be a way to encourage people to connect with the topic of food waste reduction. Therefore, the use of emotive words can be a tool for connecting and persuading audiences to take part in food waste reduction. It may also be possible to use the emotions associated with food waste to counterbalance the emotive underpinnings associated with habitual behaviors that lead to food waste [9].

4. Conclusions

The aim of this study was to illustrate that there are specific drivers that underpin why people engage in food waste reduction. By doing so, we further the limited understanding of why food waste occurs within the home [6,7]. In sum, three drivers are identified: extensive thinking, engaging in adaptable behaviours, and being emotionally involved. We believe the findings are interconnected, in that an extensive thinking process leads people to become engaged and adaptable in their reduction of food waste. Because of the interconnectivity, the drivers identified could be treated as interactive components that should not be separated if included in future research. Our findings also support previous studies, in that planning ahead when shopping [11], not relying on expiration dates [10], and management of leftovers [15] are integral parts of trying to reduce food waste. Furthermore, we demonstrated that such food reduction techniques are aligned with conscious-thought processes. Hence, thinking about reducing food waste makes engaging in food reduction behaviors more likely.

The interviews were conducted with a small sample group and can therefore be viewed in an exploratory light. As with any interviews that use small sample sizes, it may compromise representativeness [29] of the population at large. To infer generalizability from our findings, further research of the suggested uses of these insights are required.

Here, it is not possible to determine if the identified drivers equally contribute to the change in food waste reduction behaviors. However, this should be explored in future studies. Furthermore, it is unlikely that the same drivers will sway all people. Individual differences are likely, and thus some people may need different types of encouragement. We note also that many of the examples provided by participants, which helped lend insight, were given at a time when they had the opportunity to think about food waste. Reflecting on one’s own behavior is important in changing behaviour, as they may provide an explanation or motivation by aiding an attitude of curiosity towards their own behavior [32].

Furthermore, as with all interview-based studies, there are issues regarding self-reporting, and we acknowledge these—how much were the answers provided reflective of their actual opinions, feelings, or actions, and did they feel pressure, due to being interviewed, to give certain answers? Further, we need to acknowledge the potential bias of the sample group, as we purposively sampled participants that had been participating in a study where they had been asked to try and reduce food waste. Thus, interviewing people who have not previously tried to reduce their food waste may generate different answers. That in itself would be revealing, and it would show whether being part of food waste studies influence both perception and behavior related to waste.

We envisage that the findings from this study are likely to be representative of many (due to the diversity of the sample group) UK households, were they prepared to try to reduce their food waste. Here, we identified underpinnings that are important to each individual and that can encourage adoption as well as the maintenance of food waste reduction behaviors. In this way, even though through a limited number of participants, we have been able to gather and reflect on drivers that can provide a richer picture of how food waste can be reduced.

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Institutional Review Board Statement: The study was conducted in accordance with the Declaration of Helsinki, and approved by the Psychology disciplines Ethics Committee, SREP.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: Due to the possibility of identifying participants through the interview transcripts, they will not be publicly available to ensure their right to be anonymous. However, the authors are happy to send redacted transcripts (that remove all identifiable information) upon request.

Conflicts of Interest: The authors declare no conflict of interest.

Appendix A

Questions asked in the semi-structured interviews.

1. Can you please give me some feedback on how you think your participation in the study went?
2. What do you think about the study?
3. Do you think about the amount of fruit and vegetables you waste?

If yes—then ask how frequently they think about it.

4. Do you ever discuss food waste with others?
5. Is food waste a topic that interests you?

If yes—ask if this has always been the case or whether it may be the result of taking part in the study.

6. Would you say you are knowledgeable about the implications of food waste?
7. Do you think that taking part (in this study) has had an impact on how often you think about food waste?

Why?

8. Do you think that taking part in the study has changed how much fresh produce (fruit and vegetables) you waste?
9. Did taking part in the study change how much food you waste overall?
10. Do you intend to try to continue to reduce your food waste?
11. Currently, what percentage of the food that you buy/grow do you think you throw away?
12. How do you feel about wasting food?
13. What is your view of people that waste food?
14. Do you think that others care about food waste?
15. Do you care about what others may think about whether you waste food?

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