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Identifying motivations and barriers to minimising household food waste



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ABSTRACT

The amount of food discarded by UK households is substantial and, to a large extent, avoidable. Furthermore, such food waste has serious environmental consequences. If household food waste reduction initiatives are to be successful they will need to be informed by people's motivations and barriers to minimising household food waste. This paper reports a qualitative study of the thoughts, feelings and experiences of 15 UK household food purchasers, based on semi-structured interviews. Two core categories of motives to minimise household food waste were identified: (1) waste concerns and (2) doing the 'right' thing. A third core category illustrated the importance of food management skills in empowering people to keep household food waste to a minimum. Four core categories of barriers to minimising food waste were also identified: (1) a 'good' provider identity; (2) minimising inconvenience; (3) lack of priority; and (4) exemption from responsibility. The wish to avoid experiencing negative emotions (such as guilt, frustration, annoyance, embarrassment or regret) underpinned both the motivations and the barriers to minimising food waste. Findings thus reveal potentially conflicting personal goals which may hinder existing food waste reduction attempts.

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1. Introduction

It has been estimated that globally one third of the edible parts of food destined for human consumption is lost or wasted each year (Gustavsson et al., 2011). Much of the waste that comes from high-income countries has been attributed to poor marketing practices and consumer behaviour, with consumers being identified as a bigger contributor than food manufacturing, distribution, grocery retail and the hospitality sectors (Griffin et al., 2009; Quested et al., 2011). In the UK alone it has been estimated that households generate 7.2 million tonnes of food waste a year, most of which is thought to be avoidable (Waste and Resource Action Programme [WRAP], 2011a), despite research suggesting that consumers have a distaste of wasted utility (Bolton and Alba, 2012). Although the figure in the UK has dropped significantly from the previous estimate of 8.3 million tonnes in 2006/07, household food waste remains a significant problem with much scope for improvement.

There are many serious negative consequences of household food waste. Firstly, it has a social impact as it contributes towards increases in global food prices, making food less accessible for the poorest as well as increasing the number of malnourished people both in developed and developing countries (Stuart, 2009). Secondly, it has an economic impact: buying food, not eating it and

then throwing it away currently costs the average UK family an estimated £680 a year (WRAP, 2011b). Thirdly, the production and supply of food, which is subsequently wasted, has a number of environmental costs. According to the Food and Agriculture Organization of the United Nations (FAO, 2012), food waste contributes to the demand for agricultural land, placing increased pressure on the world's already dwindling forests. Food waste further has implications for water wastage. For example, it has been estimated that in the UK 6.2 billion cubic metres of water per year is wasted producing food that is then thrown away – the equivalent of 243 litres of water per person per day (Chapagain and James, 2011). Furthermore, the disposal of biodegradable waste into landfills contributes to the release of gases, most notably methane. This is a more potent greenhouse gas than carbon dioxide, with 34 times the global warming potential over 100 years (IPCC, 2013). In summary, according to WRAP (2011a), greenhouse gas emissions of approximately 17 million CO₂ equivalent tonnes are associated with the manufacture, distribution, storage, use and disposal of edible food that is wasted in the UK.

Despite the obvious imperative for research to identify key factors that motivate, enable or prevent household food waste minimisation behaviour, little research to date has directly addressed this objective. Studies that have concentrated explicitly on household food waste have primarily focussed on identifying what food is most likely to be thrown away (WRAP, 2009a, 2009b, 2010), who is most likely to throw food away (Brook Lyndhurst, 2007; Doron, 2012; Koivupuro et al., 2012; WRAP, 2009a), and how people feel

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about food waste. For example, Brook Lyndhurst (2007) identified people's top three concerns about food waste as: (1) that it is seen as a waste of money; (2) that it is seen as a waste of good food; and (3) that it makes them feel guilty. More recently Doron (2013) has also identified environmental concerns as a further category of concern about food waste, however WRAP have concluded that environmental concern is not a key concern at present (Quested et al., 2013).

Whilst the findings of such research are doubtless important, they don't address the question of why food gets wasted. Some research has attempted to identify the specific behaviours that result in household food waste. Potential behaviours identified have included: buying and/or cooking too much, not planning meals in advance, failing to compile or comply with a shopping list, failing to carry out a food inventory before shopping, impulse purchases, and throwing away food that has passed its sell-by-date (Brook Lyndhurst, 2007; Doron, 2012; Exodus, 2007; Parfitt et al., 2010; Stefan et al., 2013). Research has also highlighted relatively low public awareness of the negative impact of household food waste (Brook Lyndhurst, 2007; Quested et al., 2011, 2013) and a lack of awareness of one's own food waste contributions (Brook Lyndhurst, 2007; Doron, 2013; Exodus, 2007; Hamilton et al., 2005). However, most of the research addressing these issues has used methodologies that involve people being given closed-ended questions followed by a series of possible responses. These methodologies have limitations as they impose responses on the participant and don't give them the opportunity to voice their own views about a particular phenomenon. Qualitative research methodologies can overcome these limitations as they allow for the researcher to explore and therefore better understand complex phenomena without imposing limitations (William, 2007).

To date only two published peer-reviewed studies have attempted to elicit participant beliefs about household food waste using qualitative methods. Wansink et al. (2000) investigated people's motivations for purchasing grocery items that they subsequently failed to use. A random sample of 423 US household purchasers were asked to locate one item that they had purchased at least six months prior but had as yet not used. They were then asked in an open-ended questionnaire to explain why they had purchased the specific item, why they had not managed to use it and what they intended to do with the item now that they had been brought to their attention. Results revealed that the majority of the items people reported buying and not using were non-versatile and had been bought with the anticipation of a 'specific occasion' or 'specific recipe' in mind. However, as the occasion to use the product had failed to arise, many of the participants reported that they had forgotten about the item and – now it had been brought to their attention – they intended to throw it away. Although this study provides valuable insight into why people may fail to use specific items of food which they had purchased, it does not tap the range of factors that may influence household food waste behaviour.

More recently, Evans (2011, 2012) carried out a sociological exploration of food practices in 19 households in the UK. In-depth interviews revealed a number of potentially important themes relating to how and why household food gets thrown away. The papers were structured around issues such as: (1) feeding the family; (2) eating 'properly'; (3) the mismatch between the materiality (its short shelf life and packaging) of 'proper' food and how this interacts with the social-temporal demands of everyday life; and (4) anxieties surrounding food safety and storage. Evans concluded that household food waste is not a consequence of individuals' thoughtlessness but rather a result of the social and material conditions in which food is provided; he suggested that interventions and policy should target these conditions rather than the individual, if household food waste is to be reduced.

Although the themes uncovered in these studies represent an important starting point there is still a lack of understanding of the nature of household food waste minimisation behaviour. Knowing more about people's food waste minimisation motivations (whether goal-based, habitual or emotionally motivated) as well as their perceived capabilities to minimise food waste and perceived opportunities or barriers to food waste minimisation practices is essential if effective interventions are to be designed. Accordingly, the aim of the current study was to directly address this gap in the literature.

2. Method

2.1. Participants and sampling procedures

Participants ($N=15$) from thirteen households were recruited from the South of England, through a UK University online recruitment database. The database comprised students and non-students who had expressed a willingness to participate in research in exchange for course credits or a small fee. We employed an "illustrative sampling" method (Turrentine and Kurani, 2007) to generate a sample representing a mix of characteristics. Our sampling frame was defined by: (1) age (18–29 years/30–49 years/50+ years), and (2) household size (e.g. family/couple/single). Recruitment of participants was supplemented using opportunity sampling when it was not possible to recruit a mix of characteristics/demographics from the database alone. In order to take part in the current study, participants had to be aged eighteen or over and have sole or joint responsibility for household food purchasing. Accordingly, one or two participants per household could be eligible for inclusion. When two members of a household wished to be included in the study they were interviewed together. Participant characteristics are summarised in Table 1.

2.2. Interview procedure

The participants were invited to take part in a study about various topics on food. The interviews were carried out between May and August 2011 at the researcher's office or home, or at the home of the participant. Before the interview commenced, participants were required to read a study information sheet which contained information on the study procedure, confidentiality and the right to withdraw. If the participants elected to continue they were asked to sign a consent form and were told that they would receive £10 at the end of the interview.

The interviews were semi-structured, with the interviewer asking participants questions about the following topics:

- (1) Thoughts and feelings regarding purchasing food (e.g. *Tell me how you shop for food for your household. Can you describe a typical food shopping trip? How do you feel about shopping for food? How do you decide what food you are going to buy?*)
- (2) Thoughts and feelings regarding food choices and food preparation in the home (e.g. *Once at home, how is it decided what food is going to be eaten and when? When, if at all, does food get thrown away in your household? Can you describe why you think this happens?*)
- (3) Thoughts and feelings regarding throwing food away (e.g. *Tell me about your thoughts and feeling regarding throwing food away. Tell me how your thoughts and feelings may have changed over the years. Why do you think other people you know throw food away? Tell me how you think other people you know feel about throwing food away?*)
- (4) Thoughts and feelings regarding reducing food waste (e.g. *What do you think are the best or most effective ways to avoid or reduce*

Table 1
Household members demographics.

Participant no. ^a	Gender	Household size ^b	Age	Location	Income ^c	Education level
P1	F	Couple	31	City	21,000–40,000	Graduate or above
P2	F	Family (1 parent/2 kids)	39	Suburban	21,000–40,000	Graduate or above
P3	F	Single/lives alone	24	Suburban	20,000 or less	Graduate or above
P4	F	Single/shared flat	21	City	20,000 or less	A levels or equivalent
P5	M	Couple/shared house	21	City	20,000 or less	A levels or equivalent
P6	F	Family (2 parents and 2 kids)	43	Rural	71,000–100,000	A levels or equivalent
P7	F	Couple	26	Rural	41,000–70,000	Graduate or above
P8a/b	M/F	Family (2 parents and 3 kids)	55/49	City	21,000–40,000	A levels or equivalent
P9a/b	F/M	Couple	72/74	Rural	21,000–40,000	A levels or equivalent
P10	M	Family (2 parents and 2 kids)	41	City	41,000–70,000	Graduate or above
P11	F	Single/lives alone	75	Rural	20,000 or less	GCSE or equivalent
P12	M	Single/lives alone	34	City	41,000–70,000	Graduate or above
P13	F	Family (2 parents and 3 kids)	38	City	41,000–70,000	GCSE or equivalent

^a Four of the fifteen participants came from two rather than four separate households (see 8a/b and 9a/b).

^b 'Couple' refers to married or unmarried partners.

^c Income relates to pooled income for those living as a couple or in a family, but individual income for all others.

the amount of food that gets thrown away in the home? Which, if any, of these behaviours do you carry out yourself? Tell me how you feel about taking steps to avoid or reduce the amount of food that gets thrown away in your household.)

The pre-prepared interview questions were used only as a guide or to elicit further discussion of salient topic areas, if and when appropriate. The interviews lasted 45 minutes on average, and were recorded (with permission) and transcribed verbatim. At the end of the interview participants were asked to fill in a short demographic questionnaire, before being paid £10 (about \$16) for their participation.

2.3. Thematic analysis using grounded theory procedures

Interview transcripts were coded using grounded theory analytical procedures to identify thematic categories underpinning consumers' beliefs, emotions and behaviours with regards to household food waste. Transcripts were read and reread. Initial 'open' coding was undertaken to assign initial conceptual labels to the text, and these labels were refined as new insights emerged. Secondary 'axial' coding involved making connections between concepts and organising these into higher-order categories/themes. Further 'selective' coding generated an understanding of how the core thematic categories were interrelated (Strauss and Corbin, 1998). Throughout the analytic process the 'constant comparison' method was used (Glaser and Strauss, 1967). New instances in the data were compared to the data already assigned to codes and when similar conceptual labels were assigned these too were compared so as to assess consistency, develop understanding of the core meaning of each concept and to help refine the labels attached to these concepts.

It was not our intention to construct a comprehensive theory but instead to carry out a thematic analysis of the content at each coding stage. We have therefore used the term grounded theory only to refer to a defined set of coding procedures. This methodology has been successfully applied to several studies: for example, commuters' reasons for car-use (Gardner and Abraham, 2007) and mainstream consumers' responses to and evaluations of plug-in battery-electric and hybrid cars (Graham-Rowe et al., 2012).

3. Results

Coding procedures identified seven overarching categories that arose independently from our interview schedule. Two of these categories represented motivations to minimise food waste. These were: (1) waste concerns and (2) doing the 'right' thing. A third

category (food management) illustrated the importance of food management skills in empowering people to keep household food waste to a minimum. The remaining four categories represented barriers to minimising food waste in the home. The first two of these represented motivations to over-purchase: (4) being a 'good' provider; (5) minimising inconvenience, while the last two represented both a lack of perceived social pressure prompting behaviour change and a perceived lack of physical opportunity to engage in food waste minimisation practices: (6) lack of priority and (7) exemption from responsibility. These seven categories are described below and illustrative quotes are provided.

3.1. Waste concerns

One of the main motivations to minimise household food waste was the desire not to waste money. Unsurprisingly most of the household food purchasers in this study thought that food waste was a waste of money, (*"but to me it's a waste of money. If there is food there I'll eat it, you know"* P5) and financial waste concerns were often seen as more significant than other concerns.

"... it's not for any obvious reason like oh those poor starving children, I'd like to say that but it's not actually... I just think it's just such a waste of money really to be throwing stuff away because you've already paid for it and now you're getting nothing back for it quite frankly..." (P11)

The thought of the money they had wasted (as a consequence of discarding food that they had paid for) resulted in some of the household food purchasers experiencing negative feelings.

"It does annoy me. It annoys me more now, recently, my habit. I've just thought it's just a waste of money. Because you go out to earn don't you? You work and then you get paid and you've only got a finite amount of resources. I now see that if I throw away twenty pounds worth of food a week, that's... I had to work to earn that twenty pounds, sit behind a desk or drive a car or whatever I'm doing at work..." (P12)

Indeed a few of the household food purchasers indicated that a decrease in disposable income or a lifestyle change had resulted in them having to adapt their food waste attitudes and behaviours to become less frivolous with food.

"I think it's more of a recent thing, I think it's also to do with money because I'm a student. It's just seems that if you throw away food it's like you're wasting your own money whereas before [when I lived at home] like you're not buying it and you don't really care to be honest, you don't really think about how much it cost..." (P3)

The household food purchasers who had financial constraints felt that behaving 'frugally' (when it came to shopping for food and cooking) was fundamental to avoiding waste. This included avoiding over-purchasing food ("*I don't buy as much so our freezer is never full*" P9a) even if it meant compromising on variety and choice. Using the food that they already had at home before purchasing more food appeared to be a key technique used by some of the household food purchasers to keep food waste, and therefore food cost, to a minimum.

"[left-over meals] usually gets put in the fridge for [my husband's] lunch the next day. Actually anything for our main meals if there is anything leftover he will take it to work the next day for lunch. . . It's cheaper because then he's not eating out at work. If we don't have any left-over's he will make pack lunches from what we've got left." (P13)

Another motivation to keep food waste to a minimum came from a concern of wasted utility, in so much as some of the household food purchasers felt that to throw food away, rather than eat it, meant that the food had not fulfilled its purpose.

"It's not necessarily that it's a financial waste of money it's just I think that it's a waste of food and I think I'm quite a realistic meat eater in that I think that you know if you're going to kill an animal to eat then utilize it thoroughly. . . ." (P2)

3.2. Doing the 'right' thing

A second, yet strongly linked, motivation for minimising household food waste related to the desire to do the 'right' thing. Many of the household food purchasers talked about food waste being 'wrong', for a variety of reasons.

For some of the household food purchasers, this stance was felt to be irrespective of their personal financial situations.

"If money wasn't an object . . . I still wouldn't waste food, that's more of an ethical stance. . . I think people can be incredibly wasteful with food and there's no need to be." (P5)

The motivation to behave appropriately did not originate from the same place for everyone. Some household food purchasers described how this viewpoint had come from a time in social history when waste was generally not tolerated, possible or affordable whilst others had adopted this viewpoint from friends and family.

"Well I think I grew up with the ethos of you know my mother never used to waste anything, she couldn't afford to. So I still have that. . ." (P8a)

However, others indicated that their motivation was a more recent development resulting from their becoming increasingly aware of the negative environmental and social repercussions of food waste. Consequently they often felt bad when their behaviour resulted in food going to waste.

"I think that my consciousness is definitely changing. I don't know if it is an age thing, I have great anxiety about the way we live and on an individual level I am thinking much more consciously about everything I do in my household." (P2)

The motivation to do 'the right thing' and reduce feelings or worry about the future was also expressed as a motivating emotion to keep food waste to a minimum.

"I worry about it [food waste] on a bigger scale, more globally. Because you know we are the generation that has bequeathed our children disaster. That our generation profligate and used up the world's resources and now everything is running out. . .

so I do take on board being very careful about not wasting food. (P8b)

3.3. Food management

Food management was mentioned by many of the household food purchasers as a factor that can facilitate the minimisation of household food waste. The people who felt that they had food management skills and knowledge often described how they cooked meals in batches and stored them in the fridge or freezer ready for another day. This allowed them to cook the food while the ingredients were still fresh and to use their time wisely and cook when they were less busy therefore avoiding the possibility of food going to waste due to time constraints.

"And I normally cook up big batches of stuff so I'll cook up like chilli and then freeze it, and have that over, you know, the next few days with other things I have frozen previously." (P5)

It was apparent for some that their experience and knowledge of food management allowed them to plan in advance.

"I plan ahead, so when I sit and do my on-line shopping I've got an idea of what I'll be cooking or what I'll be using, so I don't tend to have a lot of waste." (P13)

Having the knowledge and awareness that food left over from previous meals could be re-created into a different dish was viewed as a helpful way to make sure food didn't go to waste.

"I usually do a roast chicken on a Saturday or Sunday, and then have that again on Monday with sort of roast vegetables again and use the carcass to make a stock to make a soup or something." (P2)

Knowledge about food storage, food hygiene safety and an understanding of use-by/sell-by/best-before dates were also seen as an important tool to help avoid unnecessary food waste. Having confidence in food management was said to dissipate some of the fears of getting ill or giving oneself food poisoning.

"See I am not fearful even if the steak has gone brown, it's fine. The thing is if you open up the thing and the thing stinks then you know that it's gone off. No smell it's fine. But that is, there is a lot of fear with food 'oh god you mustn't eat anything past its sell-by date.'" (P8b)

Food management skills had been taught directly ("*I think that comes from working in kitchens as a teenager.*" P4), were assimilated through the imitation of important people in their lives ("*I think it just came from seeing my parents do it. Seeing them cut the mould off the cheese and throw out the top slice of bread when it's gone blue. . .*" P4), or were self taught ("*. . . it definitely wasn't like this when I first started staying at home, [I] probably wasted a lot more then.*" P13).

Many of the household food purchasers who felt that they had the expertise were of the mind that food management knowledge and confidence was essential if food waste is to be kept to a minimum ("*. . . anything left in the house I'll make a dinner from it. I'll just look in cupboards and go and look what's in the fridge and use things up and make a meal.*" P8b). They were also aware that not everyone had these tools ("*. . . if everyone had the ability to cook and just in the way that ingredients can be put together to make something nice then there would be a huge amount less waste.*" P8a).

3.4. The 'good' provider identity

Although the desire not to waste good food or money was a significant motivation for some, so was the desire to be a 'good' parent,

'good' partner or 'good' host. The need to feel like a 'good' provider and minimise any feelings of guilt experienced if they failed to meet personal or cultural expectations was vocalised by some of the household food purchasers and this perceived need to provide was frequently fulfilled by over-purchasing.

Parents (most notably mothers) described the importance of purchasing a variety of foods perceived to be healthy and nourishing, even if it meant food going to waste.

"... it's very much to do with my feeling of being a good mother as well, having plenty of fruit and vegetables in and that feeling of having a full cupboard... even if they don't eat it you know that was my intention and that's what I am offering." (P2)

For some this wish to provide an over-abundance of healthy foods to children extended beyond over-purchasing food to the over-preparation of food with parents often cooking more food than the children would eat.

"Yeah, I do tend to over-cook for [the children] just in case. I'd rather have enough for them to eat if they want more rather than them snacking on something less healthy. So I do tend to over portion their dinners [make too much]." (P13)

Providing an abundance of food was not reserved exclusively for children but sometimes extended to feeding other family members such as partners.

"... (my husband) is like a massive pig (laughs) and he doesn't like having not very much, he always likes having a massive amount on his plate and leaving it if he doesn't want it which he does quite a lot. So I feel pressure like to make sure he has enough food so he's not feeling hard done by." (P1)

For some the wish to be a 'good' provider was centred on household guests rather than family members. This desire to be a 'good' host also resulted in food waste as household food purchasers over-purchased for social occasions.

"I had friends for lunch last week, I over-buy then, totally... I did throw some food away last week because I, I can never visualise how much they are going to eat. So that's the only time, from an entertainment point of view. Yes I, I go overboard then." (P11)

The desire to make guests feel 'looked after' extended beyond just purchasing behaviour for one household, with a perceived need to maximise the time spent with their guests resulting in another type of food waste.

"I guess if we have people over for dinner rather than keeping any left-overs we would throw them away... Say you've got friends that you don't see that often, rather than spending half-an-hour in the kitchen tidying up you're obviously going to be spending it talking to your friends, so I guess we would be more likely to throw it away and put the dishwasher on." (P7)

People who entertained guests sometimes described over-purchasing food as a way to avoid experiencing potential embarrassment of not having enough to go round.

"I am always afraid of running out [of food]... I suppose embarrassment you see that's the thing... just wanting to please, that's basically what it would be, I want everyone to be happy". (P11)

3.5. Minimising inconvenience

A further barrier to minimising household food waste concerned the desire to shop, cook and prepare food with convenience and time constraints in mind. Stocking up on food was viewed as a way of protecting yourself from the inconvenience of having to go shopping if something unplanned or unexpected happened, or

simply as a means of freeing up time for other responsibilities or personal pursuits and reducing future stress.

"... I know I can basically come in from work and there is plenty of food available for me and the children. And if anyone was ill because it's only me there wouldn't be any necessity to go out, erm. Yeah, you're sort of covered for all eventualities." (P2)

However, stockpiling perishable products as a way of minimising trips to the shops often resulted in food going to waste.

"... what I tend to do (as I am keen to have fruit in) is that I will go out and I will buy stuff and I've already got it in so I have too much and it will go off, or the two for one blueberry error, which I do waste a lot of blueberries and they're expensive but I want them in all the time so I tend to restock." (P2)

Several of the household food purchasers mentioned that they did not want to poison themselves, as they viewed getting ill as another type of inconvenience that could result in them having to take time off work or leaving them unable to carry out other commitments. This meant that they felt less prepared to take any kind of risk with eating food on or past its use-by dates or products that don't look fresh. A few of the household food purchasers reported that this concern meant they would rather throw food away rather than take a risk with their health.

"I don't know if it consciously goes through my mind but if I've got a lot of work to do and I think I can't be ill then I might be slightly less likely to take my chances and more likely to throw it away. Because I think I can't be throwing up for three days." (P1)

3.6. Lack of priority

A third apparent barrier to minimising household food waste was the low priority given to this behaviour by some of the household food purchasers. While a number of the household food purchasers felt that they had their household food management and waste under control and felt good about their behaviour and its consequences, others showed a real lack of engagement with issues surrounding food waste. The belief that tackling food waste was not a priority in their life appeared to come from various sources. One reason voiced by household food purchasers for their lack of concern appeared to stem from their belief that food waste didn't have negative environmental consequences ("... *because food rots down, doesn't it?*" P2).

Another reason was that food waste wasn't a big problem and that there were bigger problems to worry about. A few of the household food purchasers' responses suggested that, because they were already behaving sustainably in other ways, they felt ok throwing food away.

"I haven't given it an awful lot of thought to be honest. No I haven't. I mean I do put my paper in one thing and the tins in the... I separate like that, but if it's food throwing away I just throw it away. I have to be honest with you it doesn't keep me awake at night." (P11)

Finally, a sense that wasting food is the status quo was evident in some household food purchasers' narratives. Some household food purchasers felt that creating household waste was an accepted social norm.

"No, I think that everyone wastes, I think probably most people do waste like me. I think especially people that I know or I speak to do. I suppose it is because people do seem to have more disposable income or have had disposable income and it's become habit to live like that." (P6)

3.7. Exemption from responsibility

A final subset of barriers to minimising household food waste was the perception that the responsibility for food waste lay with the food industry and supermarkets rather than the individual. Some of the household food purchasers felt that they wasted food because the quality of much food sold in supermarkets was poor. Food quality, especially taste, was seen as an important factor in determining whether or not the food was eaten, especially in respect to fruit and salad.

“Yeah, and we bought these Clementines from the Co-Op the other day, a big bag of twelve, and they were absolutely inedible and we sort of turned it into a joke. . . Well I went in and prodded a few the next day, to see if they were the same. Really, really hard, it was like sucking a lemon. Erm, you know that was £2.50 and a load of fruit in the bin.” (P2)

The food industry and supermarkets were also criticised for providing some items in pack sizes that were not suitable for people who lived alone or in couples. And, even when products were sold in smaller quantities or pack sizes, some household food purchasers still felt that their choice was limited.

“Yeah, we tried buying small loaves of bread but they don’t have as much choice in like. . . you know we usually get best-of-both and stuff and they don’t. . . and they do really small slice sizes which is really annoying, they don’t just do half loaves but the same size. . .” (P1)

Financial incentives, such as promotions were also cited as a further source of food waste. These in-store marketing techniques made some household food purchasers feel that they were put in a predicament, caught between buying in bulk (which represented ‘value-for-money’ but increased the likelihood that food would go to waste) or buying in smaller quantities (which incurred greater financial cost per quantity but reduced the chances of food waste occurring).

“You buy a pack of mince, it’s cheap and you cook all of it. You couldn’t eat all of it, otherwise I would be the size of a house.” (P12).

Supermarkets were also criticised by some of the household food purchasers for trying to palm-off their own waste onto the customers through the use of ‘2 for the price of 1’ offers or pre-packed items, typically multipack fruit and vegetables.

“And the other thing with supermarkets is very often fruit, tomatoes are all pre-packed and you often can’t see how fresh they are, so it could be wastage coming from the fact they want to get rid of their rubbish.” (P9b)

4. Discussion

Qualitative coding procedures identified seven overarching categories relating to significant motivations and barriers underlying people’s thoughts and feelings about household food waste. The analysis highlighted the importance of two key motivations underlying the desire to minimise food waste (waste concerns and doing the ‘right’ thing). A third category illustrated how food management knowledge and skills can underpin food waste minimisation efficacy. Finally four main barriers to reducing household food waste were evident (the ‘good’ provider, minimising inconvenience, lack of priority and exemption from responsibility).

4.1. Motivations to minimise household food waste

For many of the household food purchasers the desire to avoid wasting food for financial reasons was viewed as a strong motivator

to keep food waste to a minimum. Our analysis also suggested that some people were uncomfortable with the idea of wasting food not just for financial reasons, but also because it represented wasted utility. This ties in with Brook Lyndhurst’s (2007) finding that the top reasons given for being concerned about food waste were that it was waste of money and that it was a waste of good food. It also supports recent empirical research demonstrating that people’s dislike of purchasing products that may go unused is driven by a distaste for the items’ unused utility, rather than purely an aversion to squandering money (Bolton and Alba, 2012). It is possible that waste concerns are influenced by the recent economic recession in the UK resulting in a reduction in consumer spending and a growing distaste for excessive consumption (Flatters and Willmott, 2009).

In the present study, some people reported that their food waste behaviour was guided by a sense of what they felt was ‘right’. Having a higher level of concern for the negative consequences of food waste was clearly a motivator to want to keep household food waste to a minimum. However, it is noteworthy that individuals rarely mentioned environmental consequences as a motivator to minimise food waste in the present study. This supports WRAP’s conclusions but differs from Doron’s (2013) finding that environmental concern was the most frequently selected motivator compared to the motivation to save money. However, Doron presented participants with a choice out of only two motivations (environmental or financial) and asked them to pick which was most relevant to them. It is possible that, while participants might select environmental concerns under such conditions, such concerns might be less likely to be volunteered spontaneously as a motivation to minimise food waste. It is noteworthy that while some participants in the current study mentioned that they grew some of their own vegetables, composted at least some of their food waste or occasionally fed leftovers to their family pet, they did not verbalise the link between these behaviours and a reduced environmental impact.

No matter what the motivational push or pull was to avoid food waste, it was apparent that the people in the current study who claimed to have cooking skills and food storage knowledge were more likely to report being in control of their food waste. Brook Lyndhurst (2007) found that participants who expressed a lack of competence in basic cooking and food management skills reported higher levels of food waste. Relatedly, Exodus (2007) found that people were more likely to report food waste behaviour if they had a strong fear of food poisoning. It was perhaps not surprising then that in the present study, those who felt confident about their food management skills and knowledge reported that they wasted very little food.

4.2. Barriers to minimising food waste

Echoing Evans’ (2011, 2012) findings, we found that the wish to be a ‘good’ provider in terms of providing healthy and/or abundant food for family or guests was a strong barrier to minimising food waste for some household food purchasers. Being able to provide healthy and/or ample food for the people in one’s life can be interpreted as being symbolic of one’s ability to protect and nurture them. Dittmar (2004) argues that constructing a sense of identity is an important driver of consumer behaviour as people purchase material goods to express who they are, and who they would like to be. Arguably this research could be extended to the purchase of food items. Thus, individuals may purchase an abundance of healthy foods to express and affirm their identity as a ‘good’ provider. Relatedly, Stryker’s identity theory argues that identity-relevant behaviours (actions that help to fulfil a particular role) may become habitual as they are important to the individual self-concept (Stryker, 1987; Stryker and Burke, 2000). By extension, it

is plausible that people who identify with being a 'good' provider may repeatedly over-purchase food because it is important for the expression of this identity.

Another factor that appeared to stand out as a potential barrier to minimising food waste was the desire to minimise inconvenience. Thus, some people explained how they bought in bulk or in excess of their needs in order to avoid unnecessary and untimely trips to the shops. This barrier appeared to be an issue for participants irrespective of whether they lived in a rural or an urban area. Furthermore, some food purchasers described how they sometimes threw away food in order to avoid the inconvenience that would arise if they were to fall ill from food poisoning. Although this latter factor is likely to be interrelated with people's cooking and storage knowledge, it was nonetheless linked to a desire to minimise inconvenience.

The importance of minimising inconvenience as a potential barrier to minimising food waste reflects the findings of Cox et al. (2010) who found that inconvenience was a widely cited reason for not adopting household waste minimisation behaviours. Furthermore, the importance of convenience in determining food shopping practices is reflected in the increased use of convenience foods and convenience food preparation that has emerged over recent decades (Beck, 2007; Gofton, 1995).

In our study it was clear that not everyone was aware of the negative consequences of throwing food away, a finding that supports previous research (Brook Lyndhurst, 2007; Quested et al., 2011). While some people didn't see food waste as a real problem, others simply felt that food waste was inevitable and, therefore, that there was not much point in trying to reduce it (see also de Coverly et al., 2008; Exodus, 2007). Also apparent was a perception that wasting food is the norm. However, because household food waste is virtually invisible to the outside world, it is perhaps unlikely that people have accurate perceptions of how much food other people waste.

On the other hand, many household food purchasers reported either that they did not waste (much) food or that they did not feel that their own behaviour contributed much to the food waste problem. A general lack of awareness of the amount of food waste generated has been documented in prior research (Brook Lyndhurst, 2007; Exodus, 2007; Hamilton et al., 2005) and it has been suggested that this lack of awareness may be as a consequence of household food waste being thrown away a bit at a time, often mixed with other household waste, stored outside the home, and regularly taken away and dumped out of sight (McKnight-Yates, 2009).

4.3. Managing negative emotions

It was apparent from the analysis that people's motivations both to reduce food waste and to over-purchase food were frequently underpinned by the desire to avoid experiencing negative emotions. Managing negative emotions has thus been identified as a unifying category in the present study.

Perhaps unsurprisingly, there was no evidence in the current study that any of the household food purchasers intended to waste food. Indeed, those who did admit to wasting food often indicated that they would feel much less guilt if they didn't create food waste. Furthermore, some household food purchasers expressed a sense of frustration or annoyance when they recalled wasting food in the past and one participant described how their food waste behaviour made them feel anxious.

Our finding that food waste can evoke negative emotions corresponds with other research which has documented guilt as a negative emotion associated with wasteful behaviour (see Brook Lyndhurst, 2007; Hamilton et al., 2005). It has been suggested that guilt could be utilised as a motivational tool in campaigns to promote pro-environmental behaviour (Bedford et al., 2011).

However, caution should be exercised before embarking on such approaches. The use of guilt to promote behaviour change is unlikely to prove successful as an isolated intervention technique and could, in fact, result in compensation behaviours such as denial either of the severity of the issue itself or of one's personal responsibility (Bedford et al., 2011). Indeed, our study evidenced such denial, illustrated through the categories 'lack of priority' and 'exemption from responsibility'. It is plausible that these barriers to household food waste minimisation represent attempts to manage and minimise uncomfortable feelings of guilt.

Furthermore, the findings of the current study demonstrate that refraining from minimising food waste might itself *protect* against negative emotions. Thus food purchasers described how the desire to be a 'good' provider and to minimise inconvenience (both of which have the potential to precipitate food waste) might have been sometimes underpinned by motivations to avoid negative emotions such as guilt and frustration respectively. The desire to avoid experiencing these negative emotions may be more powerful in influencing food waste behaviour than the desire to avoid negative emotions associated with food waste *per se*. In other words, some people might find it easier to experience a certain amount of remorse as a result of throwing away food than they would to feel guilty for failing to provide their children with an abundance of healthy food choices. Certainly, such emotional influences are likely to be in conflict.

4.4. Implications of the research and future directions

The present study has highlighted specific factors that may motivate household food waste minimisation. Accordingly, the findings suggest it may be beneficial for food waste reduction initiatives to: (1) target the potential 'waste concerns' some people might have by highlighting the benefits of reducing household food waste (e.g. the financial rewards) and (2) emphasise the point that reducing your food waste is the 'right' thing to do. The current research findings also suggest that people may need to be trained in food management skills to empower them to keep household food waste to a minimum. Many motivational techniques, including those mentioned above, are already commonplace in household food waste reduction intervention with some noted success (see for example: the Love Food Hate Waste campaign, 2013). However, the present study has also highlighted potential barriers to household food waste minimisation. Successful campaigns at a population level are unlikely to reach their potential unless they simultaneously address issues such as denial of responsibility and the potential conflict caused by seemingly unrelated everyday goals (such as the desire to be a 'good' provider), which have the potential to act as barriers to household food waste minimisation.

Participants in the current study were not told that the primary focus of the study was household food waste. Nonetheless it is important to bear in mind the potential influence of demand characteristics: responses may also have been influenced by participants' desires to present themselves in a positive light (Goffman, 1959). Furthermore, interviewees' responses may have been influenced by the status, age, race or gender of the interviewer (Charmaz, 2006).

Although we did not use a large representative sample of UK household food purchasers in this study, there is no reason to believe that the underlying motivations and perceived barriers expressed by the current sample would differ from other UK household food purchasers. Furthermore it is not unusual for qualitative research to employ sample sizes similar to that used in the current study (see Gardner and Abraham, 2007; Mann and Abraham, 2006). Nevertheless, future research may benefit from

replicating the current research using a larger stratified sample of the UK population to assess whether the current findings are replicated. Future research may also benefit from using prospective quantitative methodologies to explore whether the motivations and/or barriers identified in this study are important predictors of people's food waste behaviour.

Finally, it would be interesting to explore whether any differences expressed in motivations and barriers in the present study could reliably be associated with socio-demographic characteristics, such as area of residence, gender, and income level. The small sample size in the present study precluded carrying out such analyses in an appropriate way; however, future research would benefit from exploring such associations.

5. Conclusion

In conclusion, this research represents one of only a few attempts in the qualitative literature to identify people's underlying motivations and barriers to food waste minimisation. Carrying out research of this kind represents an important step in the development of successful interventions. The current study has identified some potential motivators to target in household food waste minimisation initiatives, but it has also revealed some important barriers that may well need addressing. It is possible that some barriers to household food waste minimisation, such as the belief that household food waste does not pose a serious environmental threat, may be relatively easy to overcome through the dissemination of food waste information. However, other barriers, such as the potentially conflicting desire to be a 'good' provider, may prove more challenging to address and may well require more innovative approaches.

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