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# To reduce or to recycle? Urban residents' views on food waste and food-related packaging practices in The Hague, Netherlands

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ABSTRACT

Urban households are an intimate nexus of food and food waste, connecting people to challenges of sustainability and inequality, in wider food systems. Household food waste (HFW) studies, including those which explored consumption practices during COVID-19, have tended to emphasize the reduction in food waste as part of behaviour change. In 2018/19 an exploratory, interdisciplinary, mixed method study was conducted of HFW perceptions and practices of urban residents in The Hague (Netherlands) with purposeful sampling (n = 19), speaking either Dutch, English or Arabic. Participants took photographs of their HFW for photovoice interviews and focus group HFW stories. The research provided a space for participants to become self-aware of the explicit and implicit understanding of their food practices and their household food waste and its related practices (i.e. food-related packaging). This finding resonated across all hierarchical levels of waste management from best practices, such as, reduction to mixed waste least preferred options. Performing HFW appears to lack comprehensive ecological contextualisation as per the latter part of the urban food system. Dutch and English-speaking focus groups seemed mostly unaware of 'what happened next' to their disposed HFW and food-related packaging, whilst the Arabic speaking focus group appeared more comprehensively ecosystem attuned. Given the impetus to a zero-waste more sustainable lifestyle, the transitory implications of knowing more explicitly about 'what happens next' to different forms of urban HFW disposal, once it is 'out of sight', could potentially offer insights into reconfigured routine HFW performance and therefore require further research.

## Introduction

Today, the global food system is widely acknowledged as increasingly unequal and threatening the health and well-being of people (FAO, 2019). Similarly, threshold limits to the well-being of planetary earth systems, like climate change, biosphere integrity, land system change, freshwater use and biogeochemical flows, that are essential to maintaining life, are at risk (Rockström et al., 2020). Food waste ranks as the third largest greenhouse gas emissions contributor, after the US and China with household food waste (HFW) regarded as a particular, critical food systems challenge (Hanson et al., 2015). Consumers in developed countries are especially singled out, as producing the most food waste in the food system, through their excessive ways of living (Gustavsson et al., 2011; Stenmarck et al., 2016). Evans (2012) suggests that the presentation of the consumer, as a guilty food waste party in a 'throwaway society', is an unhelpful reduction of complex relations. Urban food systems and consumers are of particular interest given the increasing urbanisation of the world's population, a predicted 70 % of whom are expected to be resident in urban settlements by 2050 (United Nations, 2018).

Adding to the understanding of household food waste (HFW) are snapshot studies conducted during the COVID-19 pandemic, against the backdrop of confined mobility for large swathes of society to their homes and the complex knock-on effects of aspects, such as, economic uncertainty, widely disrupted food systems and socially distanced lifestyles. In May 2020, 1500 households in the Netherlands responded to an online HFW survey of food practice questions and submissions of self-reported waste data (Janssen and Stroosnijder, 2020). This study, conducted by Wageningen University, found that except for one quarter of respondents who had reduced their food waste, HFW continued as usual, pre-pandemic (Janssen and Stroosnijder, 2020). Almost 20 % of respondents were more aware of their HFW and more were becoming 'systematic' in their food practices – using shopping lists and cooking and storing in a more aware manner, with about a third reducing their

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impulse buying (Janssen and Stroosnijder, 2020). Changes from fresh food to more long-life products were observed, with about one in three household stockpiling more (Janssen and Stroosnijder, 2020). Households had a better knowledge of what was in their fridges, freezers and pantries (Janssen and Stroosnijder, 2020). This study's findings focused on how households' food consumption and waste was adapted (or not) to lifestyles during COVID-19. It seems to confirm, the widely held appreciation, that changing household food behaviours can notably reduce the volume of HFW produced. Even so, the findings are limited in the provision of insights into the practice of final household waste disposal, for example, by mixed household waste or composting.

Wageningen University's study findings resonate with a similar questionnaire and self-reporting HFW study conducted in the United Kingdom (UK), in June 2020, by WRAP the UK government waste advisory body. This study reported a reduction in HFW, during COVID-19 restrictions, that were associated with positive food management practices in households e.g. pre-shop planning, creative cooking and eating more leftovers (WRAP, 2020). However, the complex interplay of economic uncertainty, public health impacts, restricted mobility and stay at home lifestyles for the whole household together with other factors is unclear, as is the future of HFW trends when pandemic response measures are reduced and/or removed.

Final disposal of HFW, whether as organic compost, mixed municipal household waste and/or separated recycling, can be viewed as a 'moment of consumption'. This is like Warde's (2016) view on eating. Like eating, ending HFW waste is a 'compound practice' because it is a nodal moment in which an array of other practices come together (Warde, 2016). An infusion of eating practices, in end HFW disposal extends beyond, for example, the planning, shopping, storing, preparing, cooking, sharing and/or freezing to composting, mixed waste black bagging, separated glass bottle recycling and positioning street bins for municipal collection. Inter-relationships, and the flux therein, between the space of HFW end disposal objects and services, residents' skills and knowledge of food waste and the wider food system in which their daily lives are embedded in, as well as the meaning of waste in the practice of end disposal is explored, in part, in this study.

Less attention has been given, in the literature, regarding the practice of urban HFW when the horizon is expanded beyond its immediate disposal in the household i.e. beyond 'doing' (performance) mixed waste, composting or recycling. Whatever final form HFW may take when it leaves the household, it remains a part of the food system in which people are embedded and engaged in the performance thereof. In the example of Toronto, Canada, the difficulty with shipping urban waste to other places in the province is that it does not solve the household waste problem. It only moves it out of sight. Waste disposal practices which encourage an "out-of-sight, out-of-mind" attitude do not help the urban environment's efforts to reduce the amount of waste through the 3Rs – reduction, reuse and recycling (McKay and Arnold, 2012). The principle of local responsibility means that municipal governments, which have the responsibility of disposal of waste, must do so within or as close as possible to their own area of jurisdiction (McKay and Arnold, 2012; Landells et al., 2022). This also problematizes who shares responsibility in waste practices – whether it's municipal food waste services or the responsibilities of the households. Like those in the intertwined fields of sociology of consumption (Blue, 2017; Evans, 2014) and social practice of everyday life (Hand and Shove, 2007; Shove, 2010; Warde, 2016) the everyday HFW practice as performed through visual and verbal narration in the focus groups, as groups of 'same language' community members, departs from the 'sovereignty' of the consumer (Warde, 2014). 'Sovereignty' refers to the view that consumer wants and needs (albeit 'heavily influenced' by market influences), preferentially determine, at an individual level, what food is purchased and how it is consumed by households (Warde, 2014) – and by extension what and how food is wasted. Warde (2014) stresses an alternative view of consumption that resonates with this study, namely that of consumption (and HFW) as performed practice with habits and routines, dispositions, shared understanding, flows and sequences and embodiment.

From the view of urban HFW as practice, this study's orientation also passes by the plethora of food consumption and waste studies which aim to ascertain the magnitude of the problem (van Dooren et al., 2019) and those seeking to understand and inform solutions (Stancu et al., 2016) – what Shove (2010) refers to as the ABC (Attitudes, Behaviour, Choice) studies of sustainability and consumer behavior. According to ABC studies, Shove (2010) contends are conceptually constrained with respect to societal change or transformation(Shove, 2010; Stancu et al., 2016). Notably, Shove et al. (2012) emphasise the configurations and reconfigurations of practice as object and performance(Shove et al., 2012). Societal transformation and reconfigurations of HFW practice are beyond the scope of this exploratory study, even so, gaining fundamental insights into change as signposts for future studies are possible.

Seeking a deep understanding of urban HFW, the authors of this paper conducted a study of everyday HFW perceptions and practices – pre-COVID-19 – in 2018/19. There was a particular interest in language diverse residents living in the international city, The Hague (Netherlands).[1] An overarching, pragmatic, mixed method research design was employed. The qualitative component followed a 'Snap-Send-Share-Story' photo-elicitation method involving the same participants through-out the research engagement: from 'snapping' photographs of their HFW to sharing them in individual semi-structured interviews and later telling group stories, using their combined photographs, in focus groups (Trevenen-Jones et al., 2020). Liebenberg (2018) declares that the photographs people take, are expressions of choices of what, when and how to photograph, informed by community values as well as how people want to be known. As such, the HFW photographs people intentionally and/or unknowingly don't take also tell (perform) a story about who people are and how they practice HFW. Participants' reflexive journey through the study, visual links to their HFW and the narrative focus groups enabled participants to tell stories linked to and beyond their photographs. This paper presents the surprising, focus groups' finding viz. 'out of sight, out of mind', HFW from home to beyond.

### *Food waste in the Netherlands*

Food production-consumption and household waste is undergoing transformation within public policy, municipal management and homes, in the Netherlands. This is partly informed by sustainability commitments, such as those detailed in the United Nations 2030 Sustainable Development Agenda. Sustainable Development Goal 12.3 addresses responsible consumption and production, and includes a target to reduce food waste by half (United Nations, 2015).

Connecting policy and households are municipalities who are responsible for implementing national waste policy and waste management plans (Dijkgraaf and Gradus, 2014; Goorhuis et al., 2012). These remain rooted in the historical, 'Lansnik's ladder', a hierarchical flow of preferential waste management steps, starting with the most favoured, namely, prevention or reduction followed by, of reuse, recycling, incineration with energy recovery, incineration and landfill. This ladder is also used in combination with the 'Moerman Food Use Hierarchy' which priortises the prevention of food waste and then the reuse, recycle, recover and then only disposal (Soethoudt and Timmermans, 2013). More recently, these hierarchies are fundamental to the Dutch 'government wide' 2050 circular economy programme and it's vision of zero waste; where materials, from textiles to food are ideally valorized though-out cycles of production and consumption, enhancing resource utlisation and reducing the need for incineration without energy recovery and landfill (Government of the Netherlands, 2016; Lansink,

[1] Study area in The Hague comprised the Bezuidenhout neighbourhood extending to the Central Innovation District (inner city).

2018) Additionally, government, businesses, universities, non-profit organisations and individuals are collaborating to reduce food waste e.g. the 'Samen Tegen Voedselfverspilling' ('Together Against Food Waste') taskforce.[2]

There has been a recent, nominal reduction in HFW, even so, the magnitude of this challenge and associated costs continues (van Dooren et al., 2019). Using three data collection methods, van Dooren et al., 2019 found that consumers, who self-reported, tended to under report their HFW, that solid HFW amounts to 13 % of the food purchased, while a sorting analysis determined that 41.2 Kg of solid food was wasted per person, per year in 2016 (van Dooren et al., 2019).

End HFW disposal, in this paper, refers to the final HFW that is disposed of, typically via the services from the municipality of The Hague, including contracted collections on its behalf. It excludes the sharing of food, for example, via apps and informal arrangements as well as leftovers to be eaten by the household whether people and/or pets. Varying though-out the study area, black bags containing mixed household waste are routinely collected by the municipality, either from residents' bins placed on street pavements, and more recently the underground-overground municipal waste bins that are conveniently scattered through-out neighbourhoods (See Fig. 1) or apartment waste facilities.[3] Where the service is available, organic HFW can be disposed of via household '**g**roente-**f**ruit-**t**uin afval' (GFT) bins that are then directly or indirectly collected by the municipality. The direct English translation of the GFT bin is a 'vegetables-fruit-garden rubbish' bin or as more widely known as the household organic small waste bin.

Residents in the study area can voluntarily make use of a local community compost initiative viz. De Compostbakkers or The Compost Bakers in English ("De CompostBakkers Buurtcomposteren," n.d.). They could also use their own compost in their gardens – although in a city neighbourhood with a predominance of apartments and row houses, this is likely to be limited in extent. Clusters of municipal recycling bins can be found throughout neighborhoods for residents to dispose of separated recyclable waste, such as cardboard, plastic, glass and paper. The 'real world' everyday extent to which select non-edible items associated with HFW can be and are recycled here is unclear e.g. plastic wrap and cardboard boxes of frozen pizza.

## Methods – Implementation of focus groups in a qualitative HFW study

Three 'same language' homogeneous focus groups were conducted in The Hague, between October and November 2018 based on purposive sampling. Nineteen participants were recruited from three language groups, as per participant language preference, viz. Dutch (n = 7), English (n = 7) and Arabic (n = 5). Language was used as an accessible measure of diversity and because it enabled participants to express themselves more comfortably. It is an entry point and does not infer definitive groups nor the many ways in which participants may define themselves. Other primary recruitment criteria were (i) 18 + years, (ii) resident in the Bezuidenhout neighborhood, (iii) from one of the three targeted language groups viz. Dutch, English and Arabic, and (iv) routine involvement with their household food management e.g. managed the shopping list, did the shopping, prepared the food, packed and stored food (bought and after meals), were involved in the food waste i.e. the practice of food which includes food waste with various possible ways of avoiding it, interpreting it etc. The participants upon recruited were asked to share their HFW views and to take HFW photographs as per their interpretations and their views. Sample size was informed by the desired six to eight participants per focus group. The three languages resonate with the multitude of home languages spoken in The Hague and more specifically with the languages spoken in this study neighbourhood of The Hague. The semi-structured interview asked basic socio-demographic aspects including place of residence and typical food engagement activities in the household for screening of the potential participants based on the inclusion criteria (Trevenen-Jones et al., 2020). Table 1 provides a selection of baseline questionnaire details about the participants. The baseline questionnaire focused on basic socioeconomic factors which supported with the recruitment of homogenous language groups. Hence, no questions were asked about household food waste practices as not to bias nor predefine the perceptions of the potential study participants on their household food waste practices. These details also reveal a nuanced picture of the diversity of participants, within and between groups, such as dietary preferences.

A topic sheet, designed to elicit HFW group narratives, whether stories or vignettes, with increasing depth, guided the moderation of the focus groups. Topics ranged from what participants enjoyed about food to imagining zero HFW as well as asking the participants' process of understanding how, why, and what they wasted and what HFW meant in respect of daily practices. Early in the sessions, a photo narrative stimulus activity was conducted, resourcing a selection of participants' HFW photographs that had been pre-selected by them, then anonymized and numbered. Audio-recordings of each focus group were transcribed and, where necessary, then translated and all material quality checked. Braun and Clarke's reflexive thematic analytical approach was used to analyse the data (Braun et al., 2019; Braun and Clarke, 2006). Verbal and photographic data were regarded as analytically indivisible from one another. Codes and themes were reviewed by a member of the lead research team who had not been involved in this analysis.

As the focus groups were a final part of a sequential, qualitative data collection method, involving the same 19 participants, over a period of two to three months (from recruitment to focus groups), it is important to appreciate researchers and participants' reflexive research journey. Given that HFW tends to be private, tacit, and largely underestimated (van Geffen et al., 2016) a creative, reflexive and extended 'snap-send-share-story' method was designed and implemented (Trevenen-Jones et al., 2020). This was essentially a photo-elicitation study, where photovoice semi-structured interviews preceded focus groups that were designed to stimulate group narratives in the story telling tradition (Riessman, 2008). Photovoice is viewed as a participant empowering form of photo-elicitation, especially of marginalized communities, as initially employed in public health studies (Wang and Burris, 1997). Ethics approval, for this study, was given by the University of Leiden Faculty of Governance and Global Affairs Ethics Committee.

## Out of sight, out of mind

### *Complexity of food practices as compound part of end HFW*

Participants HFW photographs were about the practice of food transitioning to food waste; of edible and inedible food waste, primarily in solid, liquid (to a lesser extent) and packaging forms. An advantage and disadvantage of the use of participants' own HFW photographs was the evidently strong pull of the visual and 'creative ownership' this resource had on participants' initial constructions in the Focus groups. Yellow sticky notes were provided to all participants who help make their photo narratives more coherent. For example, if an additional photo was needed to make sense of the group's constructed narrative, they could use a yellow sticky note with a few notes to explain the narrative. They could also use these notes to describe their narratives. Participants also had to reduce the number of photographs by approximately 25 % as a means of directing group decision making in the construction of the group's meaningful HFW narratives. Not all groups

[2] Taskforce and their initiatives, such as, the 2019, #verspillingsvrij (waste free) campaign which aimed to raise awareness, provide tips for households and schools as well as assist businesses and entrepreneurs to better manage food. See: https://samentegenvoedselverspilling.nl/

[3] The Hague municipality website. See: https://www.denhaag.nl/en/waste-and-recycling/household-rubbish.htm

**Fig. 1.** GFT bin (for fruits and vegetable organics) (the left and center) and Underground-overground residential mixed household waste bin system(right) in study area (Bezuidenhout, The Hague) (Photograph by Author, 2024).

**Table 1**
Summation of select participant baseline questionnaire data.

| Language framed group | Dutch | English | Arabic |
|---|---|---|---|
| **Baseline Detail** | | | |
| Gender (f,m) | 6,1 | 4,3 | 0,5 |
| Age (years) | | | |
| 18–29 | 2 | 1 | 4 |
| 30–59 | 5 | 6 | 1 |
| Length of stay in Netherlands* | | | |
| Local Dutch | 6 | – | – |
| Less than 5 years | – | 4 | 5 |
| More than 5 years | 1 | 3 | – |
| Dietary Preference | | | |
| Flexitarian | 2 | – | – |
| Omnivore | 3 | 4 | 4 |
| Vegetarian | 2 | – | – |
| Vegan | – | 2 | – |
| Other | – | 1 | 1 |
| Education: Tertiary and higher | 7 | 7 | 5 |
| Employment Status | | | |
| Part-time | – | 3 | – |
| Full-time | 4 | 3 | – |
| Student | 1 | – | 5 |
| Homemaker | 1 | 1 | – |
| Unemployed | 1 | – | – |

* Dutch participants were typically resident in the Netherlands, with one female considering herself Dutch/British. English participants tended to be expats, from the UK, Canada, Finland, India, Ireland and the USA. Arabic participants were from Syria, Iran and Iraq and had relatively recently made a home in the Netherlands. Part of this involved 'studying' the Dutch language.

used the sticky notes to construct their group's narrative, for example, the Dutch group and the Arabic group. Nevertheless, participants remained strongly focused on the show and tell performance of the photographs – albeit re-constructing them into a group narrative of their HFW. Table 2 presents portions of these narratives and the full lay-out of the photo narrative, per group.

Photo narratives constructed by the Dutch and Arabic focus groups (Table 2) similarly presented the practices of food transitioning to waste. Whilst the English focus groups' photo narrative of food and food waste was structured around three themes viz. avoidable waste, unavoidable waste and other which was the only group that wrote on the yellow sticky notes as indicated in Table 2. The Dutch group's photo narratives were contrasted between the themes of abundance and frugality of food. The Arabic groups' photo narratives were centered around the theme of 'new' practices vs 'traditional' food practices. In part, this can be considered a reflection of the socio-economic circumstance of the Arabic participants, many of whom had recently arrived in The Hague (also see Table 1). The material conditions of society, including those which influence access to and use of food as well as HFW disposal objects and services, in the photo narratives are different. The evidence suggests this results in different food and HFW practices. It is, however, much more than that. The transition from food-to-food waste, in the Arabic group,

**AS3**: …starts from the whole idea of buying it or thinking about it.

With a shared appreciation that food is social,

**AS1**: …We are social beings. We need to have contacts with each other.

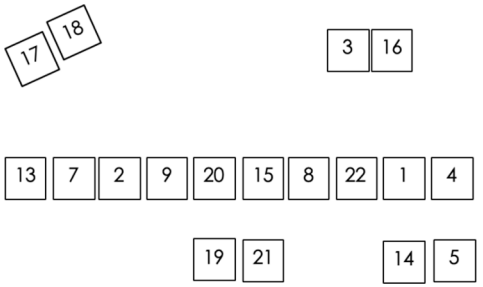
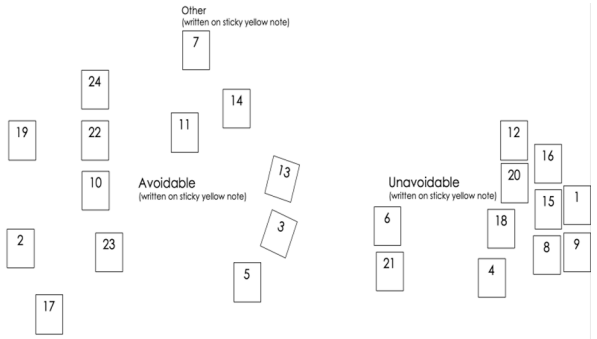
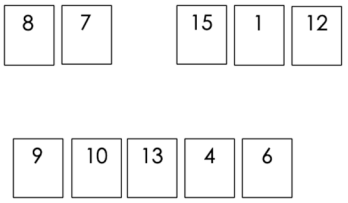
This overarching understanding persisted despite the evidence of at least two distinct disruptions to their practice of food- food waste. In their home countries, generosity of food was an expression of hospitality, a value.

'traditional' food practice. Simultaneously, participants recognized the dilemma it presented with respect to the resultant excess of HFW.

For example, at 'home':

**AS5**: …[when] we cook for a group of people [guests], there is a food waste. … It's not only about giving them the extra food, but we also can't judge how much they waste food. …we can't just tell them that they need to finish your plate, right? So this is the real waste of food when you have a group of people over.
**AS3**: … I don't eat someone else's plate. So when they can't finish it, I will have to throw it away.
**AS5**: That's the real Food Waste.
**AS2**: That's true, but in our traditions, no one takes food home with them after a gathering. …

**Table 2**
Portion of photo narratives constructed by the three focus groups and sketch of whole narratives using numbers on each photograph.

| Dutch FOCUS GROUPS | English FOCUS GROUPS | Arabic FOCUS GROUPS |
|---|---|---|
|   |   |   |

**AS4**: This is what we're used to. It's not that we don't give them food to take, it's them that don't accept. Just like we don't take if we were the invitees.

In transit:

**AS1**: I've been in a refugee camp in Iraq… We used to go to the self service to eat, and if we finish and there was extra food, people that wanted to eat in the evening, could take it with them. Four people were responsible for cooking, and one person for buying everything. We had more time for other things. More time, and it's also economical, cheaper.

A short while later, in response to [AS1],

**AS3**: …my experience in the camp, sometimes we had no wasted food which was good. But other times, most people used to throw the food away if they didn't like it. The garbage was filled with food.

And much later in the session,

**AS5**: …in the Netherlands, I see different ways of dealing with food than what I used to see in Syria….Everyone eats what they need to eat. So it doesn't imply you eating a big amount of food. …it's a bit different. Even if you just offer a small meal to your guests, it's not important to them. They can eat and finish it, and won't talk about it.

A relative abundance of sufficient food, effort, free time, and food waste juxtaposed the scarcity of choice in the refugee camps. In the Netherlands, this practice can be said to be undergoing re-interpretation in this group, alongside new material configurations and the growth of adaptive knowledge and skills. Even so, the significance of food traditions persists. "Only glass and similar garbage" (AS2) are recycled by the Arabic focus group in the Netherlands. Organic waste is not composted by them. This may be a consequence of their apartment dwelling and/or the lack of organic waste (GFT) services. They did not elaborate thereon so it is difficult to say this with certainty. Nevertheless, their recycling suggests a learning of the material configuration of recycling bins, the location thereof in the neighbourhood and the rules of what should be recycled and in which bins. Arguably, this is also about the practice of being a Dutch resident which is of important to this group, with their focus on making a new home in the Netherlands.

Being at home and themselves, away from home was also important to the English focus group and HFW was part of this. The English focus group presented themselves as widely knowledgeable and skilled in food management, defining themselves as a group who felt strongly against HFW whilst acknowledging they wasted for various reasons. They were also determined to learn the material HFW circumstance in The Hague and how to navigate it. This is illustrated in the excerpt below:

**ES5:** GFT, yes. I use them all every time I try to recycle on my food waste in the proper manner that the city has arranged it… It's a daily routine.
**ES6:** yeah, similar …I've checked about recycling; … Coming from the UK where I recycled as well, I just wanted to continue…
**ES3:** …the system is pretty much streamlined. We have the dedicated, uh, places where we can dispose the things…not only related to food, but also the clothes, the shoes. Uh, if it is the bottles…
**ES1:** …I do separate the glass and the plastic

The Dutch focus group similarly felt strongly about the practice of HFW and doing it properly. It is also evident that DS4, who is Dutch, like the English focus group, is striving to re-embed knowledgeably and skillfully with respect to HFW, in The Hague (Den Haag).

**DS1**: …in our street, we've everything separate…So I can throw paper away separately and then that glass or those things, and the rest of the waste,… and I hear from other people also that mixing it up, I find it a bit strange.
**DS5**: I find it bizarre that … we still don't have to separate plastic, that we do not have mandatory green waste. That we may throw everything just like that in the gray container, I find that quite interesting that that is allowed just like that, that that is possible, that there are no more strict rules about that…
**DS4:** …We've moved recently, from London to Den Haag and in London I always separate… except my compost because I don't like compost very much. [Group Laughter]….I'm a bit afraid of maggots and worms, so I don't do that. But all the plastic, even if it is dirty, or all, let's say, if we had ordered pizza, you know, those carton boxes, we could do them all in the blue bin, with glass, everything together. And that was then nicely divided from the waste that you could not recycle,… then I came here and I read … you should not do that because all the plastic that has come in contact, …with food, that is dirty and just belongs in the gray bin.

Being 'frugal' was a part of being Dutch according to this group. However, despite the commitment to recycling and composting, the Dutch focus group expressed a conflict of 'frugality'. It was, for example, considered wasteful if organic HFW was assigned to composting as a consequence of excessive lifestyle rather than remnants of food like cut-offs during meal preparation.

**DS4:** [responding to DS5] …I find it very interesting that you say that, that what goes on the compost heap, that that is not waste in itself, but you could just have eaten it for example, if you had eaten it on time, then it should not have gone onto the compost heap. Isn't that waste too then?
**DS5**: Yes… [but] for me the things that go onto the compost heap for example, the peels or the bell house from vegetables or fruit. …I rather throw it on that heap instead of on the garbage belt…
**DS4:**… suppose that I have a bag of apples, and I have left them there for so long that they're just not good anymore. So they go to your compost heap….Don't you find that a waste?
**DS5:** … Yes, actually I do… it's extra, that is not consumed. …but indeed, that whole apple that is thrown away, that is just all extra food that you have in your house, that is not used for the purpose that you bought it for, so in principle that is just waste.
[conversation about defining food waste as per group interpretation]
**DS2**: … of something that is actually good to eat and you don't use it, even though it comes, or- in the GFT bin or in the grey bin, is waste, but I can also follow a bit what [DS5] is saying, like in the compost heap I find it less waste compared to when it goes into the grey bin.
**DS5**: Yes.
**DS7:** … if it goes into the compost bin, if you take the leftovers of food to compost, then it is waste …
**DS6:** …it is a very complex story …

### *HFW beyond the home*

The finding, 'Out of sight, out of mind' infers a disjuncture in the routine relations between material, knowledge and skills and significance, regarding the practice of HFW. As illustrated in the previous section, reducing the amount of HFW in the mixed waste stream was important to groups, or at the very least they practiced reducing their final mixed HFW by recycling and/or composting. Absent from participants HFW photographs were pictures of final HFW disposal. Photographs of participants' organic waste (GFT) bins, mixed waste street collection bins, underground-overground bins, recycling bins and black bags were nonexistent.[4]

In respect of the Dutch and English Focus groups, the moment groups' placed organic HFW in the composting or in mixed waste black bags either in the street or underground-overground bins or whatever parts they thought were recyclable in the local recycle bins, represented

[4] As mentioned previously this could be partly attributed to the method and the exploratory nature of the research.

the bookend of their food story and a closure of the practice thereof. Almost as if to say their duty of responsible HFW was done. It was only when probing their narratives pertaining to one of the final topics viz. imagining a zero-waste home for a month, that the moment of final disposal of HFW beyond the home sphere came into the foreground of the discussion.

The Dutch focus group viewed HFW disappearing into 'containers' and rather distrustingly felt that separated waste, especially organic waste, may end up in the 'same [mixed] heap'.

**DS5:** …you throw away the food … goes into the container and goes away.

And later.

**DS5**: …we actually may throw everything [reusable or not] just like that in the gray container [mixed household waste]… do I know where it goes to? just throwing it on one heap, let's say.
**DS4:** …in London, even though you throw it in the blue bin [non-edible food related recycling], a whole lot of it is actually not recycled…..…

While the English focus group attempted to 'properly' dispose of their HFW this was undermined by their lack of knowledge about but what happened next to their HFW i.e. expressed as a reluctance to go the 'extra mile' when waste appeared to 'magically disappear'. Like the Dutch focus group there was a sense of distrust in the material arrangements e.g. hoping their compost would be appropriately managed.

**ES1:** …I do separate the glass and the plastic, but I honestly don't-I'm not– I don't know too much about what happens after it with it. I don't know where it goes to, what they do with it. And yeah. So, it doesn't push me to make the extra effort to really go the extra mile for it, because I just don't know.

And later.

**ES5:** …I think … it doesn't disappear like it doesn't just magically disappear into the air when is- when it goes out of my house, uh, I just hope that compost waste will be actually composted and can be used sensible manner… I am not fully aware of all the processes but, … follow every, like possible way to recycle them…

However, the Arabic focus group seemed to have a more complete ecological understanding and skills of HFW; where HFW was 'useful' and in sight with awareness. That said, when transitioning to new material configurations of food-food waste this wider understanding was not presently translated in practice.

**AS2**: It's not that we wasted less [Dwelling in Syria versus Netherlands]. We could do useful things with this food. We had pets, chickens or animals, that we could feed it to. Here, you just throw it away. It's shameful…

And Later:

**AS5:** It depends on the country. It's different from a country to another. In Syria, the wasted garbage is usually taken to be burned somewhere. But here, I have no idea how it's done.
**AS4**: Or some animals in Syria can open the bags to find something to eat. We have lots of homeless animals….But normally, there are places for garbage. They usually burn it. We don't actually recycle garbage, unfortunately.

These findings present a rich tapestry of end HFW practice in an urban, diverse context. However, because this study was exploratory, and as is typical of focus group interaction, discussion of topics ranged from partial to incomplete and detailed. At times this limited what could be inferred from the data and to what extent.

## Discussion and Conclusion

As the Netherlands reconfigures its waste management, including HFW, towards an inclusive, equitable sustainable future, it is important to better understand 'end HFW' relationships. Cities, like The Hague, with its diversity of people and food systems provide an opportunity to gain insight into urban lifestyles and HFW. Such insights are meaningful, in a world, where most people, in developed countries, live in urban diverse communities and where perceptions and routine practices of HFW can be a complex combination of the explicit and tacit.

Study findings suggest that there is a concerted effort by the Dutch, English and Arabic focus groups to know and be skillful about how to 'do' (preform) final phase HFW, whether composting in organic waste (GFT) bins, separation, and recycling and/or mixed waste disposal. It's about learning the rules of 'proper' disposal in a 'streamlined' waste system in The Hague. Transgressions are viewed as a 'bit strange' and perceived insufficient regulation to ensure HFW recycling (as applicable) is considered 'bizarre'. The interplay of knowledge and skills and bins as material infrastructure from 'grey' mixed waste bins for municipal street collection and underground municipal mixed domestic waste bins, to organic waste GFT bins and recycling bins were expressed as routine in groups daily lives. Even so, there are constraints and contentions related to understanding of HFW and use of this 'system'. This was highlighted by the Dutch focus group who considered it wasteful to dispose of excess food, which should have been avoided, in the organic GFT bins, yet it was still better than mixed waste disposal. Whilst the Arabic and English focus groups were still adapting to life in The Hague waste management system.

The 'out of sight, out of mind' finding, offers a window into how urban society in the Netherlands does and might in the future manage their HFW in practice. Beyond recycling, GFT organic waste composting and the uncomfortable black bagging of HFW as mixed waste, are good intentions, a lack of knowledge and some distrust. It is hoped it doesn't all end up in the same mixed 'heap' in landfill and that 'compost waste will become actual compost' [ES5]. Where, HFW in whatever final form it is disposed of, appears to 'magically disappear' into bins, especially the underground-overground bins, and taken away by municipal service. It didn't seem as if groups consciously thought of what next. Only when deeply probed, and in response to imagining zero HFW, did the Dutch and English focus groups reflexively wonder and guess. The English focus group, for example, wondered 'where it all goes', guessing possibly 'landfill' with food recycling 'over water' and hoping compost became compost. There was a despondency in their realization of their lack of knowledge about the latter parts of the urban food system in which they were embedded in. They wondered whether all their HFW management was the 'proper way' and the available infrastructure was 'all…for nothing?' By contrast, to some extent, the Arabic focus group, albeit lacking in knowledge about their new home, and feeling shame about being wasteful yet also in a dilemma of food as generosity of hospitality (traditions), were more ecologically embedded in their food system. Consistently through-out the session, they spoke about themselves as embedded in an 'ecosystem', where food waste was useful beyond the table to feed other animals, and the inferred knowledge of waste incineration ('burning').

Through-out, although never specifically named, is the routine practice of the waste pyramids viz. Lansink Ladder and Moerman's Food Use (See Section 1.1), that of reduce, reuse and recycle. These hierarchies are about best to least desired waste practices. They are also about the interpretation of routine waste management objects and services, such as, black bags for mixed household waste, underground household mixed waste bins, GFT organic waste bins, municipal and private service household waste collections, as well as the significance/s thereof. The findings of this study infer that these bins and services tie into hierarchical 'best practice' effectively presenting a range of end food waste disposal organising moments. These are moments or points where choices are performed in the routine disposal of food as mixed waste,

regenerative compost, recycled food related items or other. In a similar way, Hand and Shove (2007) assert in their study of the practice of routine household consumption, that the freezer is more than a socio-technical object, it is an organizing point of consumption (Hand and Shove, 2007).

The 'out of sight, out of mind' finding spotlights the HFW juncture between households and the public sphere of waste management. It suggests an apparent incongruity between households' routine practice of the final disposal of their HFW – regardless of best practice hierarchy – and their lack of knowledge about how waste is managed thereafter. This mirrors the 'out of sight, out of mind' waste practice in other contexts such as Singapore where waste obscurity model is argued on insufficient knowledge of the households specifically on the waste processes and recycling steps form an informational barrier as well as obscurity that disconnects individuals from their waste, promoting waste production (Hui et al., 2023). If recycled, landfilled, or incinerated, then how, why, and where in The Hague, for example, and how would HFW practices transform if households were more knowledgeable about this. It is worth noting that shifts in practices are complex and involve more than being better informed. As previously mentioned, final HFW disposal can be viewed as an extension of Warde's (2016) eating as a point of consumption, bringing together an array of food-food waste practices (Warde, 2016). What does this mean when people do not know 'what next' after their disposal of HFW? What is the significance of good sustainability practices, such as composting and recycling, without the perspective of what happens after the urban homestead, coupled with a measure of distrust? The emphasis on zero waste and regenerative cycles of production and consumption that, today, define the sustainable project in the Netherlands (Government of the Netherlands, 2016) and elsewhere, seemingly gloss over the reality that people presently and may always have, to some extent, final food waste that goes somewhere i.e. whether organic, recycled glass or a mixture of organic and inorganic HFW mixed in with other household waste. The latter phases of final waste management beyond urban residents' homes are absent in the discourse, beyond a rudimentary inference that good will come of composting and recycling and a subtle warning of: 'here there be dragons' regarding incineration without energy recovery and landfill. Groups' negotiations of final HFW disposal in practice are about good faith, best practice within means and material configurations, hopefulness and distrust yet having no other perceived options beyond the urban municipal 'magically disappearing' waste service.

Although this paper does not delve into identity, it is an angle worth exploring further in future studies. For example, how these HFW disposal objects, services and practices are viewed can also be said to reflect who communities are and like to be known as. The Dutch focus group's expression of frugality illustrates this argument. According to participants, being frugal echoes a wider Dutch community viewpoint on life and identity which in turn reveals tacitly known and shared rules about HFW. If disposal of an excess of 'apples', that could not be eaten, in the compost bin is wasteful, then the inference is the existence of a tacit rule which is to practice modest consumption and only produce essential 'HFW' – that can be composted. Through the narratively expressed disruption of the Arabic focus group's participants lives as refugees, insight is gained into shared, tacit rules of feeding HFW to animals within the vicinity of households, in their origin/home country, as a first ecological option before considering final waste disposal in bins – thus reducing the amount of final HFW. Other groups were skeptical about the extent to which The Hague residents recycling was recycled by the city. This was offset by their recognition that they also didn't know what the process was on plastic or composting waste in the city.

There appears to be a fluidity of interrelationships between HFW objects and related services, knowledge and skills and significance thereof as expressed in embedded practice in an urban context with a diversity of residents. This illustrates a complexity of consumption, beyond blaming the consumer and pushes the boundaries of existing literature which runs the sustainability gauntlet from 'gate to plate' and waste and household practice (Evans, 2014; Quested et al., 2013). That people do not know where their final HFW in sustainably 'good' and/or 'poor' forms go, and the management thereof is disconcerting. HFW that disappears from the view of the household into underground street bins, for example, removes from view the frequency of HFW and accumulated volume thereof – effectively transferring awareness and responsibility beyond the household. Findings highlight a gap in the social contract between citizens (urban residents) and municipal governments, like the City of The Hague, whereby both parties should consider further engagement to better contextualise HFW hierarchies of disposal and connect, in an empowering manner, HFW disposal performances with end waste processes like landfill, incineration, serviced composting of organic HFW (via GFT bins) and/or recycling of related food products, such as, plastic covering. There are also potential opportunities for food suppliers, processors, retailers, and food waste management firms to innovate and design, in a people and planet empathetic manner, food products, bins, practices and services that more fully consider HFW practices and end waste processes.

Recent studies, conducted in the Netherlands and United Kingdom, on consumption and HFW during the early waves of COVID-19 suggest that changes in household food practices, like preparing shopping lists and eating more leftovers, resulted in reduced HFW (Janssen and Stroosnijder, 2020; WRAP, 2020). However, the wider food systems impact, where a diversity of urban residents are or are not aware of what happens to their HFW after it leaves their 'homes' and the visible sphere of their routine HFW practices is not captured in these 'snapshot' pandemic studies and remains largely unknown. Looking beyond this exploratory HFW study, conducted in The Hague, practice theory offers an appropriate and meaningful theoretical frame to study HFW as performance, at the interface of the privacy of the home and final disposal in private and public social spaces.

Public sector policy makers, the private sector, schools and non-profit organizations, promoting sustainability, may also consider varying and localising strategies which strive to avoid and reduce food waste e.g. through food practices like smarter shopping lists and better management of food in fridges and other storage and eating leftovers (''reuse) and through regenerative circular practices where food that becomes waste is used to enrich soils, for animal feed and/or for bio-energy. Notably, there is a need to resonate with different 'audiences' in relation to varying social positions, particularly by age cohort, culture/language, socioeconomic profile, and rootedness in places where they live. Our observation that environmental values and identities did not consistently predict waste management behaviors, does not imply that environmental values and identities are unimportant. Rather, we found that practices can be associated with the ways people become or learn to be places and have particular meanings and as such being dislocated from those contexts and/or learning new ways of practicing sustainability as a function of municipal and wider societal change, disrupts household coherency of food and HFW practices. An extension of this is the 'out of sight, out of mind' food and HFW infrastructure, systems, and practices together with partial or a lack of knowledge about what ''actually happens'' to HFW waste leads to uncertainty, and more widely, a lack of accountability and shared responsibility beyond the household. We thus propose that wider communication strategies are designed in a way that enable local interpretation and ownership. For example, defining a vision and principles that can be visually interpreted into everyday stories of food and HFW relationships and practices that resonate with different local communities. Allowing also for translation into different languages and spotlighting of hidden pieces of the food/HFW journey with knowledge. In this way sustainability best practices become locally meaningful, cultivate awareness and better link household food/HFW practices to the well-being of a whole city, like The Hague and beyond. In turn this can shift practices.

## CRediT authorship contribution statement

**Ann Trevenen-Jones:** Writing – review & editing, Writing – original draft, Methodology, Formal analysis, Data curation, Conceptualization. **Min J. Cho:** Writing – review & editing, Supervision, Resources, Project administration, Methodology, Funding acquisition, Formal analysis, Conceptualization. **Jyothi Thrivikraman:** Writing – review & editing, Visualization, Resources, Project administration, Funding acquisition, Formal analysis, Data curation. **Daniela Vicherat Mattar:** Writing – review & editing, Visualization, Validation, Resources, Project administration, Investigation, Formal analysis, Conceptualization.

## Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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