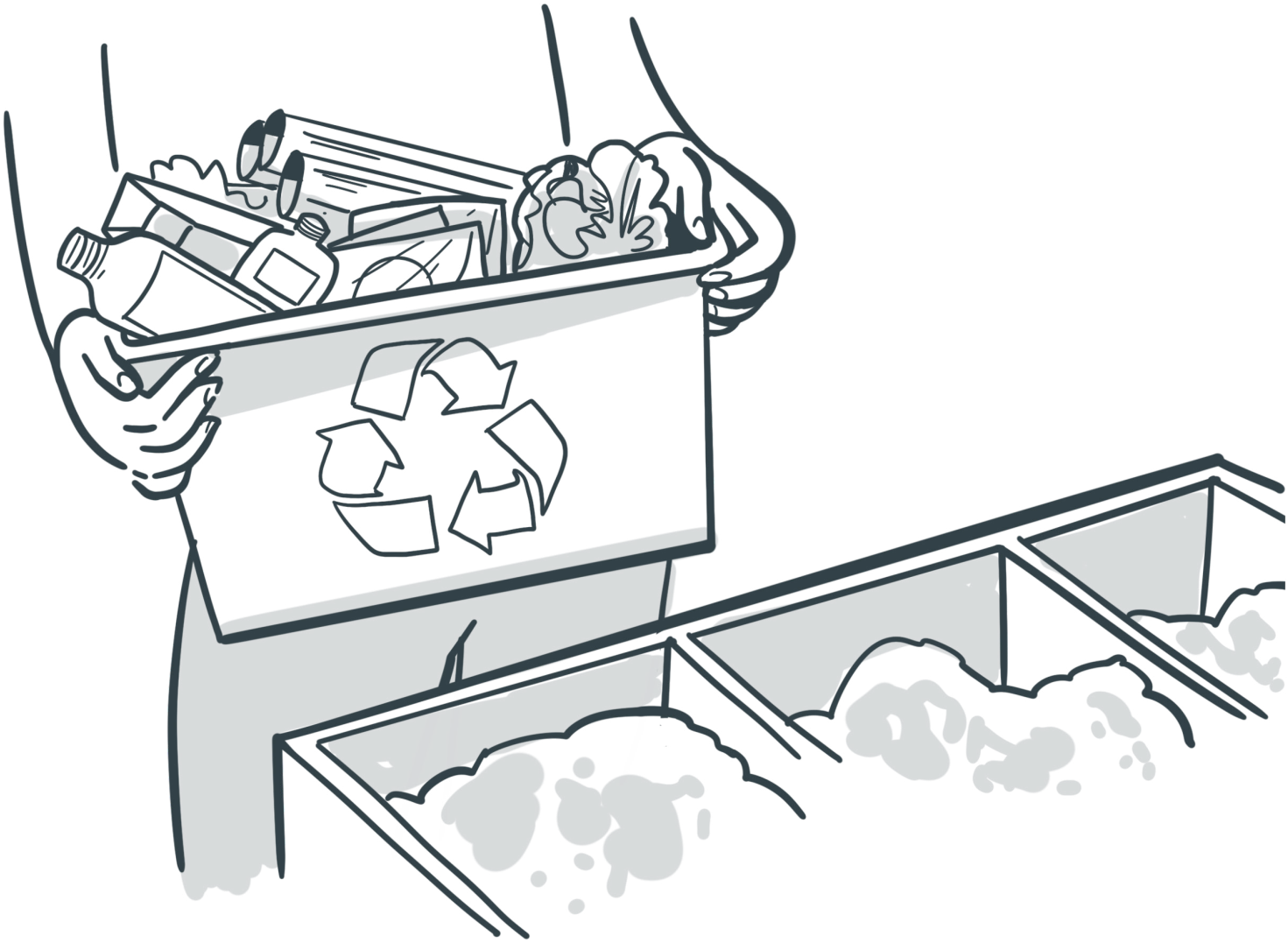
PPiPL

PLASTIC PACKAGING IN PEOPLE'S LIVES

Household Recycling: Managing Plastics at the Home and Hearth



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Our partners

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Glossary

A-B Gap:	Attitude-Behaviour Gap
DEFRA:	Department for Environment, Food and Rural Affairs
DIY:	Do-It-Yourself
EPR:	Extended Producer Responsibility
HoH:	Head of household
ONS:	Office of National Statistics
PET:	Polyethylene terephthalate
PPE:	Personal Protective Clothing
PPiPL:	Plastic Packaging in People's Lives
PVC:	Polyvinyl chloride
UKRI:	UK Research and Innovation

Executive Summary

Challenge

Recycling of single-use plastics remains a major challenge in achieving sustainable consumption and waste management in the 21st century. The ubiquitous usage of single-use plastics across consumer culture continues to be driven by their combination of durability and relatively low cost. This is despite these characteristics ensuring that greater amounts of waste end up littered amongst the natural environment and enduring over greater periods. This report shares insights from the consumer insights work package of the interdisciplinary research project entitled 'Plastic Packaging in People's Lives' (PPiPL).

Plastic Packaging in People's Lives

The PPiPL project is funded as part of the UKRI's Industrial Strategy Challenge Fund to support research that addresses widely understood problems in relation to plastic packaging which if solved will unlock existing barriers to fundamental systems change.

The overarching purpose of PPiPL is to fundamentally rethink consumer attitudes and behaviours around food plastic packaging.

This report includes findings from the Consumer Insights work package of the PPiPL project centred on the factors that influence consumer households' consumption and disposal of plastic packaging. This includes the historical, economic, and culturally instituted factors that shape choices; and the material, social, and technical contexts where household interactions with packaging occur.

Key findings

Existing research draws upon the attitude-behaviour gap to emphasise a simple disparity or 'gap' between consumers' intentions to recycle and their actual recycling behaviour. In contrast, our accounts reflect a diverse range of tacit and explicit constraints around the home, throughout the market, and beyond individual behaviours (and even individual consciousness) that reflect or result in actual and imagined negative consequences. Our findings highlight the influences that consumers' assumptions, the interrelationships between their household and workplace environments, and their moral discourses have on the ways they think about and dispose of plastic waste.

Recommendations

Recommendations extend from modest grassroots measures that neighbourhoods and communities can take, to local authority interventions, manufacturer and retailer adjustments, and broader national policies.

1. Continued simplification is required at national and local levels to minimise households' confusion around recycling.
2. Rubbish should be collected at least fortnightly across all council areas to minimise waste build-up, storage constraints, and consumer apathy in the home.
3. Recycling messaging should take into account the importance of consumers' experiential learning when handling and sorting their rubbish.
4. Interventions must recognise that occupational settings influence recycling at home.
5. Reducing plastic must also address food waste.

Introduction

What are plastics?

Most plastics encountered in everyday life are manufactured from fossil fuels (crude oil, natural gas) and belong to a family of polymeric materials that can be sub-classified as thermoplastics (i.e. depending on their capacity to be reheated and reshaped) or as thermosets (i.e. depending on their capacity to be heated and shaped only once)[1].

Valued for being versatile, durable, lightweight, and relatively inexpensive to produce, plastics have become omnipresent in our daily lives, shaping the development of modern societies. Plastics are deeply integrated with technology and engineering, transportation, construction, retail, and a variety of industries that require adaptable, cost-effective and disposable packaging including food, beverages, and pharmaceuticals. Single-use plastics in particular - i.e. plastic packaging and materials which are only used once before they are thrown away - have become so widely used across our global consumer culture that plastic waste now represents one of the key contributors to environmental crises[2].

Single-use plastics are furtively omnipresent in the sense that they are not often something that many consumers think very carefully about when shopping and eating. Nevertheless, they remain ever-present in the background, providing the packs, containers, bags, bottles, and utensils necessary for consumers to acquire, transport, and consume the vast array of items that they want. Single-use plastics are thus characterised by their 'passengerial status': rather than being the main driver of consumers' experiences, they accompany consumers as silent passengers throughout their journeys with various grocery items[3].

Increasing demand for these silent passengers has contributed markedly to the global rate of plastics production, rising to approximately 360 million metric tonnes in 2018[4], of which single-use packaging represents up to half of the total production[5].

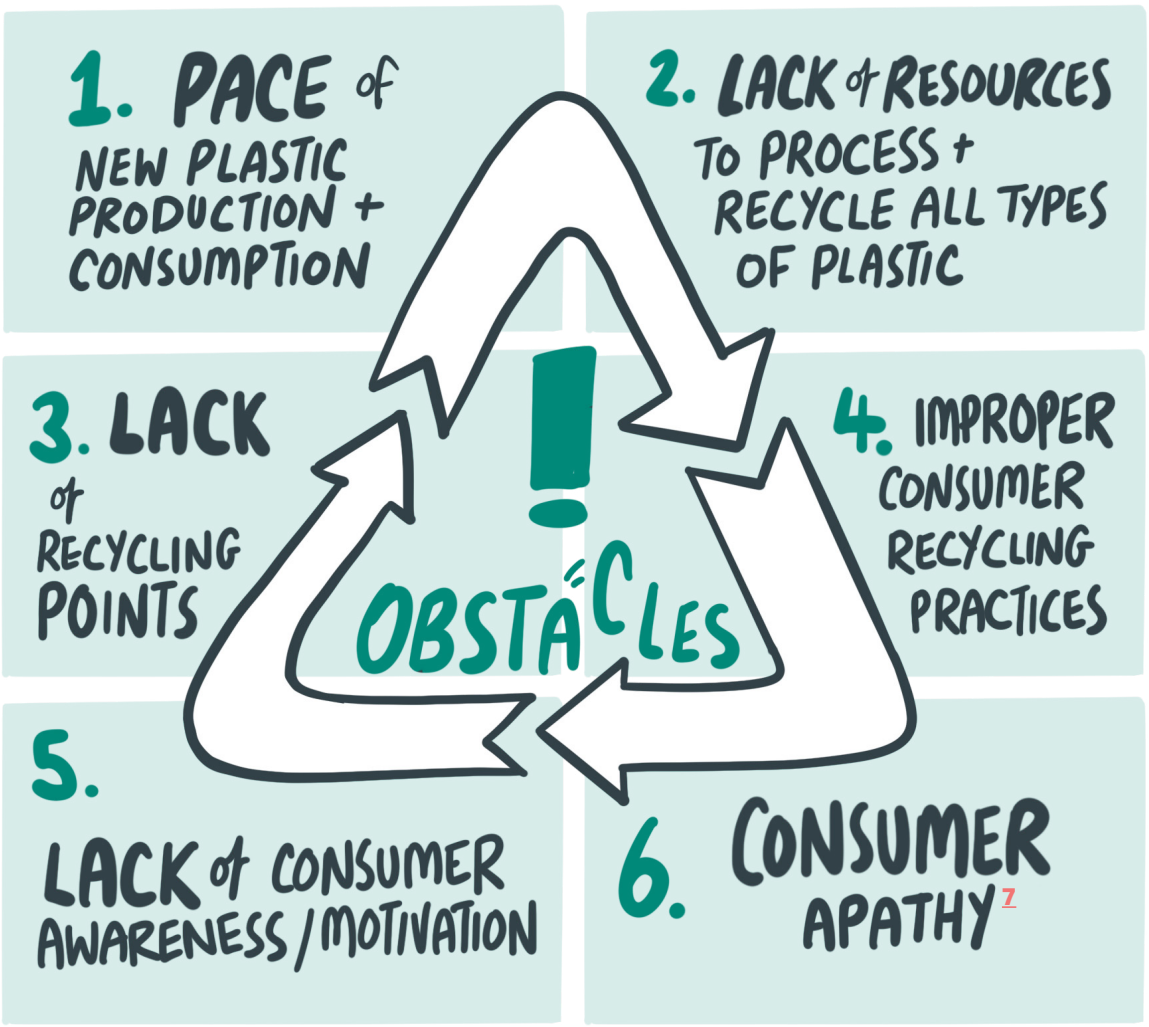
After being used once, most single-use plastics end up disposed of in hazardous and unsustainable landfills, burned up by incinerators causing the loss of valuable resources and the release of toxins, or littered throughout the natural environment, accumulating in our oceans, rivers, and soils where, because of their durability, can persist stubbornly for extended periods as pollutants to our ecosystem.

In recent years, policymakers have announced bans and restrictions on single-use plastics and various stakeholders have signed the UK Plastics Pact which includes committing to several targets by 2025 in relation to plastic packaging[6].

Recycling: A household concern

Despite high levels of production and the near ubiquitous usage and consumption of plastics, plastic waste management is frequently evaluated as being inadequate, under-resourced, or even non-existent across many regions of the world.

Many countries have accelerated research and pumped investment into developing recycling infrastructures. However, there remain obstacles that restrict the effectiveness of recycling initiatives. Obstacles include:

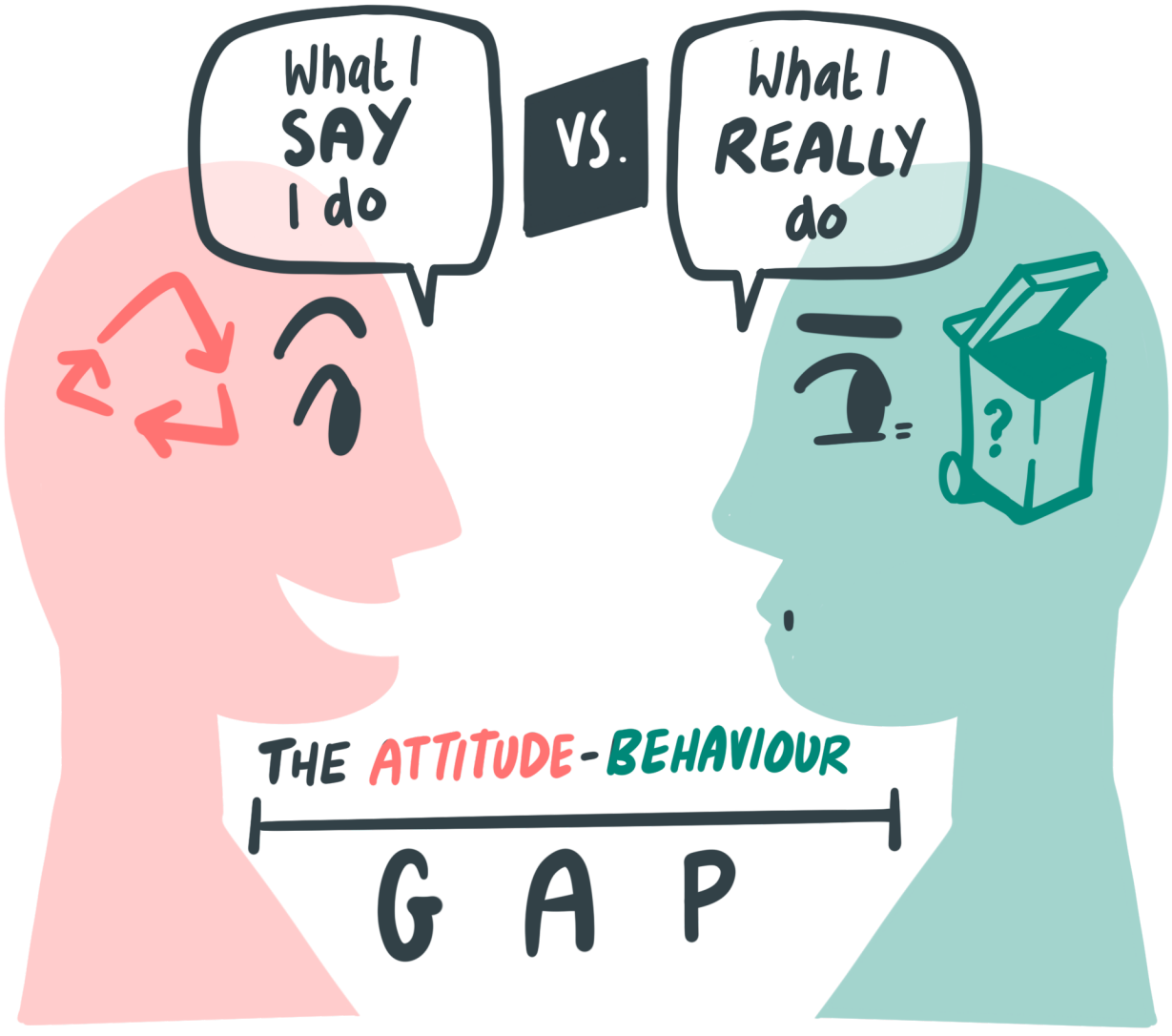


The everyday choices and behaviours of consumers are recognised as playing a pronounced role in overcoming challenges related to plastic waste, making recycling an especially consumer-centric issue[8]. Although British consumers' attitudes towards plastic packaging in grocery products tend to be negative[9] and polling finds that a majority are concerned about plastic pollution[10], minimising usage and increasing the recycling of plastic packaging across the UK must be improved. In 2021, out of the 2.5 million tonnes of plastic packaging waste generated throughout the UK, only approximately 44.2% was recycled[11].

Even though UK tap water is treated to some of the strictest levels in the world, 7.7 billion bottles of water are sold every year resulting in millions of single-use plastic bottles being littered or sent to landfills or incinerators throughout the country every week[12].

The attitude-behaviour gap (A-B gap) - or the imbalances between consumers' attitudes towards an issue and their behaviours toward that issue - allows us to analyse the inconsistencies between what people say about recycling and how they actually recycle.

The A-B gap sits at the core of existing analyses of the behavioural aspects of sustainability[13]. Research suggests that the source of the A-B gap emerges from ineffective messaging strategies and that consumers would be motivated to commit more fully to recycling and sustainable lifestyle routines when exposed to better targeted cognitive and emotional cues[14].

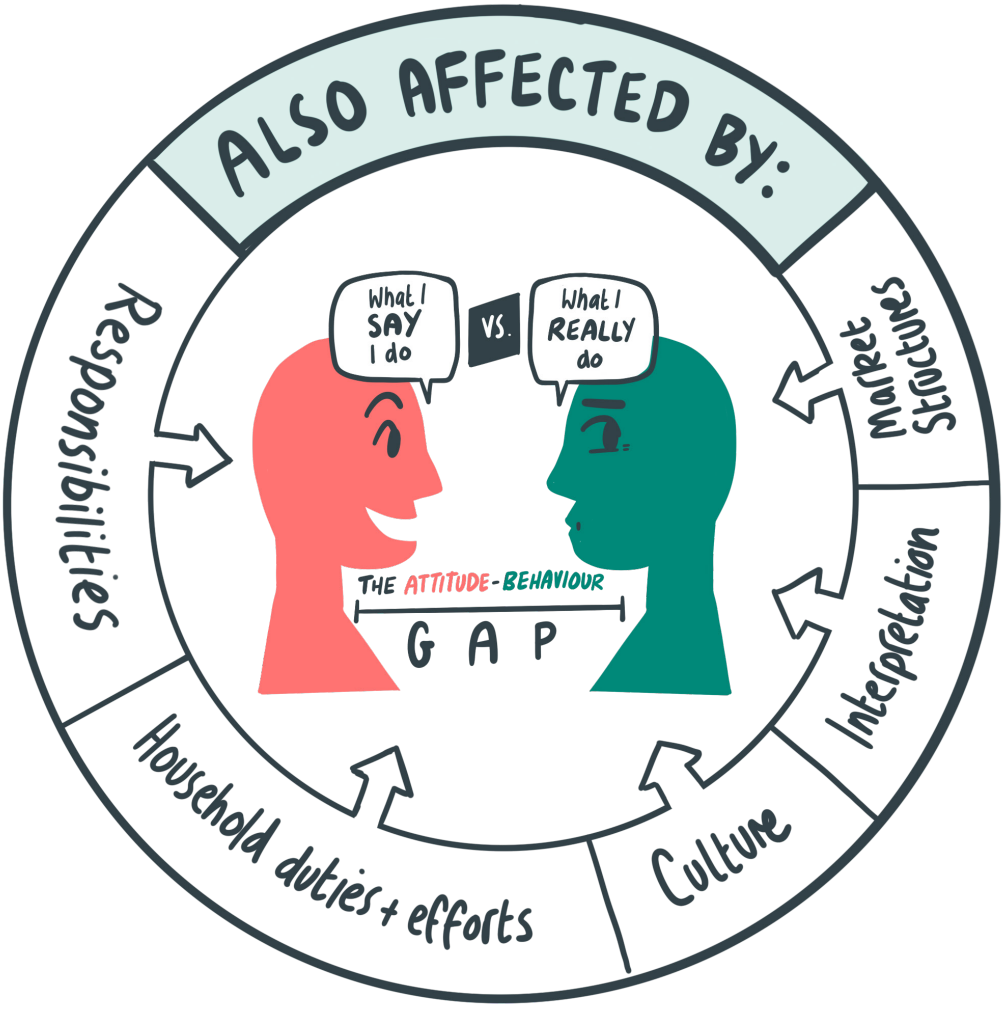


However, others have argued that sustainable consumer behaviour cannot be reduced to individuals' motivations and messaging strategies alone, but depends upon:

+ Real and imagined responsibilities;
+ Duties and efforts at the household level[15];
+ Diverse cultural perspectives;
+ Interpretations, and contradictions of what it means to be, for example, a "green" consumer[16]; and,
+ Market structures such as the "entire supply chain of decisions and choices [that] have occurred before the consumer reaches the store"[17].

Accordingly, it is important to generate in-depth insights into the circumstances, resources, discourses, activities, and constraints that contextualise households' food-related behaviours which will have an impact on plastic packaging consumption and recycling.

In the context of plastic food packaging, the aim of this report is to develop a more holistic understanding of the variety of ways in which household interactions with single-use plastics are positioned within specific interpersonal, familial, and socio-cultural landscapes. Our findings reflect a diverse range of significant barriers around the home and within the marketplace which hinder the efforts of households to pursue more sustainable lifestyles and engage in meaningful recycling practices.

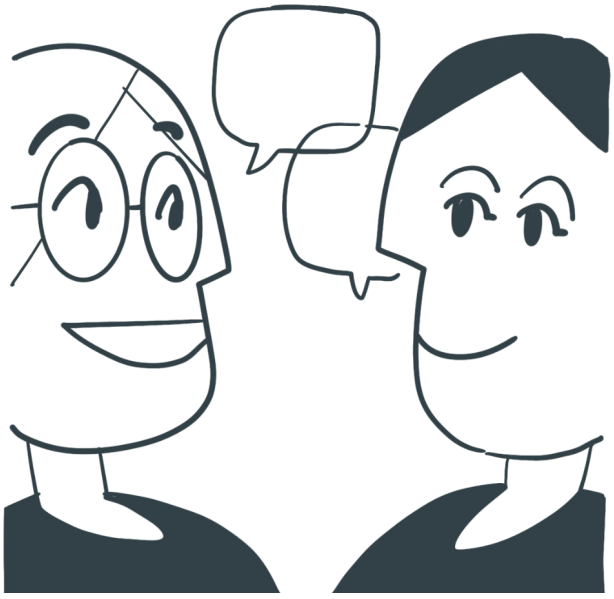


Overview of Study

This report is based on evidence from the Consumer Insights work package of the Plastic Packaging in People's Lives (PPiPL) project which included two stages:

STAGE 1:
INTERVIEWING AND DIARY KEEPING

STAGE 2:
DELIBERATIVE DISCOURSES INVOLVING ONE-TO-ONE CONVERSATIONS BETWEEN CONSUMERS AND A SCIENTIFIC EXPERT



The overall aim of this work package was to develop a detailed and in-depth understanding of the personal, social, and material contexts in which consumers' everyday experiences of plastic packaging are positioned and their relationships with plastic-related knowledge.

Stage 1 - Household Ethnography

We collected ethnographic data from 27 households across two counties in the UK (15 households based in one Northern county and 12 households based in one Southern county) centring attention on their mealtimes, shopping practices, and associated usage and disposition of plastic food packaging in various aspects of their routines and daily lives. When sampling households, we followed the Office of National Statistics' (ONS) 2019 definition of a household as:

+ One person living alone, or a group of people (not necessarily related) living at the same address who share cooking facilities and share a living room, sitting room or dining area. A household can consist of a single family, more than one family, or no families in the case of a group of unrelated people[18].

Our primary focus of investigation was on the "head of household" (HoH) defined as the adult household member who is primarily responsible for food shopping and food preparation and undertakes all or most of the domestic duties needed to maintain the household. Diversity and representation of different types of households was purposefully sought out with the only mandatory criterium for inclusion being that the HoH is an adult (i.e. 18 yrs. old or older).

Our sample included 1-person to 6-person households, varying in terms of household composition (e.g. people living alone, couples, or lone parents with 1-2 dependent/non-dependent children, student households, tenants in a multi-occupancy home) and household tenure (e.g. rented, student accommodation, own home/mortgage). Our participants also showed diversity in terms of age (ranging from 19- 60 years old), sex (20 females and 7 males) education (ranging from Higher National Diploma (HND), A-level and university-level qualifications), occupational area (e.g. education, business, communications, administration, science, environment, agriculture) and the frequency in which their food shopping was undertaken. Drawing upon this sample, we focused on food-related activities of the HoHs that took place in public, private, personal, and communal settings (including the home, the workplace and food shopping environments) to shed light on consumers' everyday encounters, routines, habits, and norms regarding to plastic packaging.

Our data collection with heads of households involved multiple rounds of ethnographic interviewing, site visits and observations of household behaviours, weekly catchups, fieldnotes, and diary-keeping. Heads of households were invited to play an active role in the data collection process and were asked to keep a diary about their experiences relating to plastic food packaging, including photographs, videos and reflections facilitated by mobile phones/smartphones. Pantry, rubbish bin, and fridge logs were also kept providing insights into packaging-related issues that could feed into improving urban recycling rates or redirecting food away from landfill. By adopting this approach, we were able to gather in-depth insights into more private and personal settings where accessibility was limited.

Stage 2 - Deliberative Discourses

To more fully understand consumers' attitude formation around plastics and smart alternatives, a second stage of research was undertaken in the form of 'deliberative discourses'. The deliberative discourse method involves structuring one-to-one conversations which - unlike interviews - involve two-way discussions which allow issues, concerns, questions, and assumptions to be explored and examined in detail [19].Fifteen one-to-one conversations were organised between HoHs and a relevant scientific expert. The objective was to design an exchange between a layperson and a specialist in polymer and plastic materials where differences in expert and non-expert perspectives could be identified, divergent views about existing packaging materials explored, and underdeveloped consumer awareness of novel and smart alternatives to plastic could be addressed. It was important to include a scientific expert in conversation with consumers because an expert could confidently respond to and expand upon any questions posed, exhibit credibility in the eyes of the public, and be capable of providing the latest and scientifically accurate information.

These in-depth conversational-style discussions between experts and non-experts were grounded to several specific plastic-related problems and solutions, thus providing the opportunity to observe how consumers' thoughts about, meaning-making around, and attitudes concerning the future of plastic packaging play out when faced with scientific facts. All deliberative discourses were attended and video recorded by an unobtrusive researcher who made notes throughout the conversations.

Data analysis of materials generated from Stage 1 & 2 of the fieldwork involved the identification of emergent themes through a back-and-forth movement between data and explanatory materials from the academic literature. This process involved moving iteratively between small parts of the data, initial understandings of the whole set of data, and relevant literature.

Findings: Navigating a Minefield

Household confusion over recycling plastics emerged as a considerable issue. Our findings here are shadowed closely by others who have detected consumer confusion over the material make-up of plastic packaging items, which bins they should be deposited in, and how these items should be treated before being placed in the appropriate bin[20]. Although appreciative of their local councils' efforts to bolster recycling capacities and the kerbside collection of waste materials, most households we spoke with felt more should be done to educate, incentivise, and ease their management of waste.

One participant described the domestic tasks of identifying, sorting, and managing plastic waste as "a complete minefield of things". At the heart of this minefield is the ubiquity of plastics in consumer culture. The huge amount and types of plastic packaging found in the marketplace means that 1) avoidance is not feasible for most households in the UK and 2) effective recycling requires specialist knowledge.

> "So, I'm aware that I've got lots and lots of plastics in my home of various different kinds and that there are various different ways to recycle. And then there are some where there are just gaps where I don't know. And sometimes I try and find on the internet about how to dispose of these things. **I don't always get the answer**."

> "It is a minefield I think because you do find that you read like the small print sometimes it is there, you know what I mean? But yeah in Lidl now they sell 100% compostable [bags]. The bags they use for the vegetables and things are 100% compostable but I wouldn't put them in my compost because, as you say, you're not sure is it."

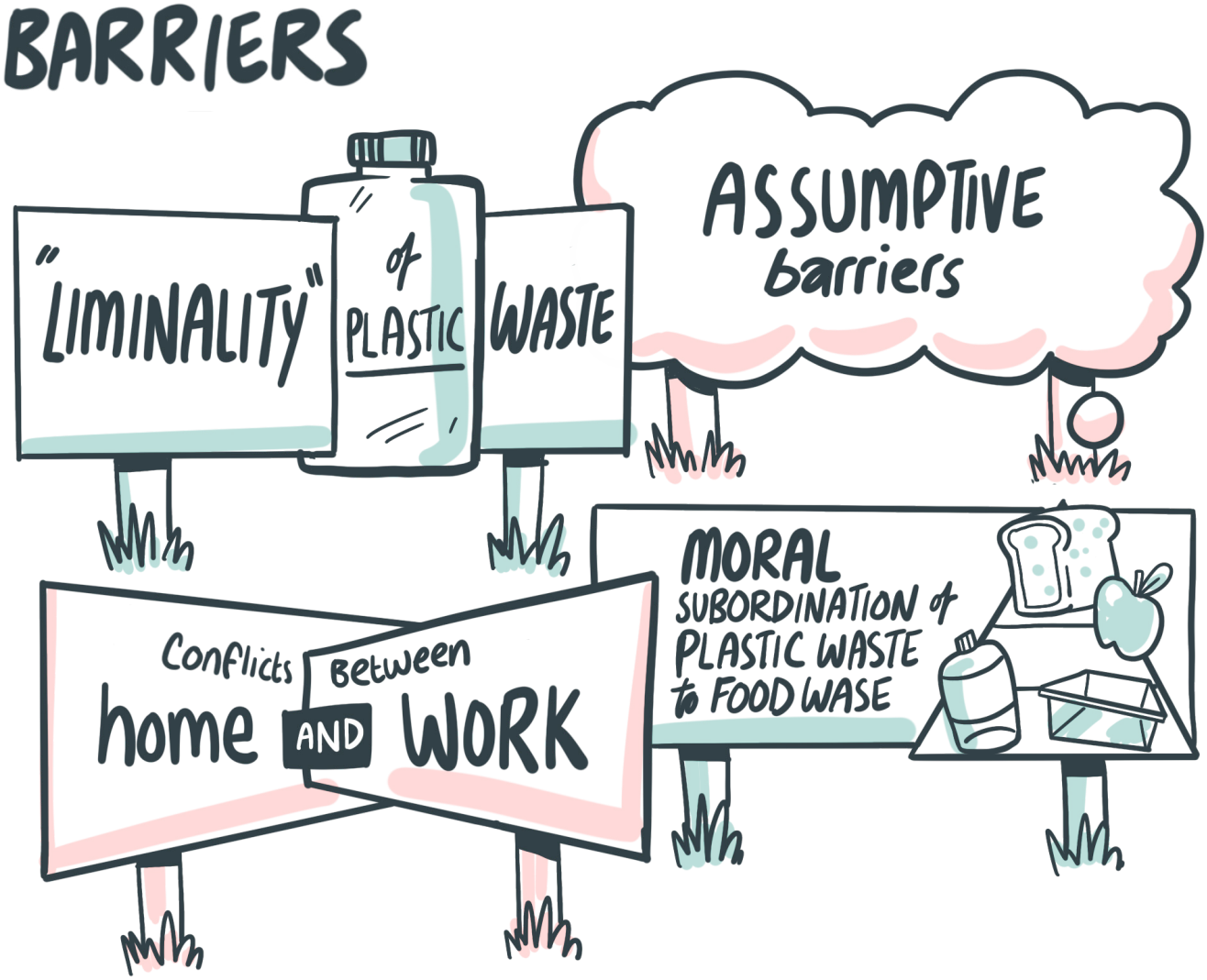
Sometimes even production variants of the same product come with different recycling recommendations. One participant showed us two identical same-brand condiments that came with contrasting recommendations on their labels - one suggested 'BOTTLE widely recycled; LID check locally' while the other displayed 'BOTTLE & LID Recycle':

The same branded item with contrasting recycling instructions

The inescapable nature of plastics and common lack of understanding with what to do with them present a key challenge for building a stronger recycling system in the UK. However, beyond these well-accepted barriers, we observed deeper catalysts for uncertainty, apprehension, and perceived burden that stem from:

+ Managing the 'liminality' of plastic waste in the home.
+ Assumptive barriers to recycling.
+ Conflicts between occupational versus domestic lives.
+ Moral subordination of plastic waste to food wastage.

We now outline each of these in detail.



Doing the dirty work: Managing the liminality of plastic waste

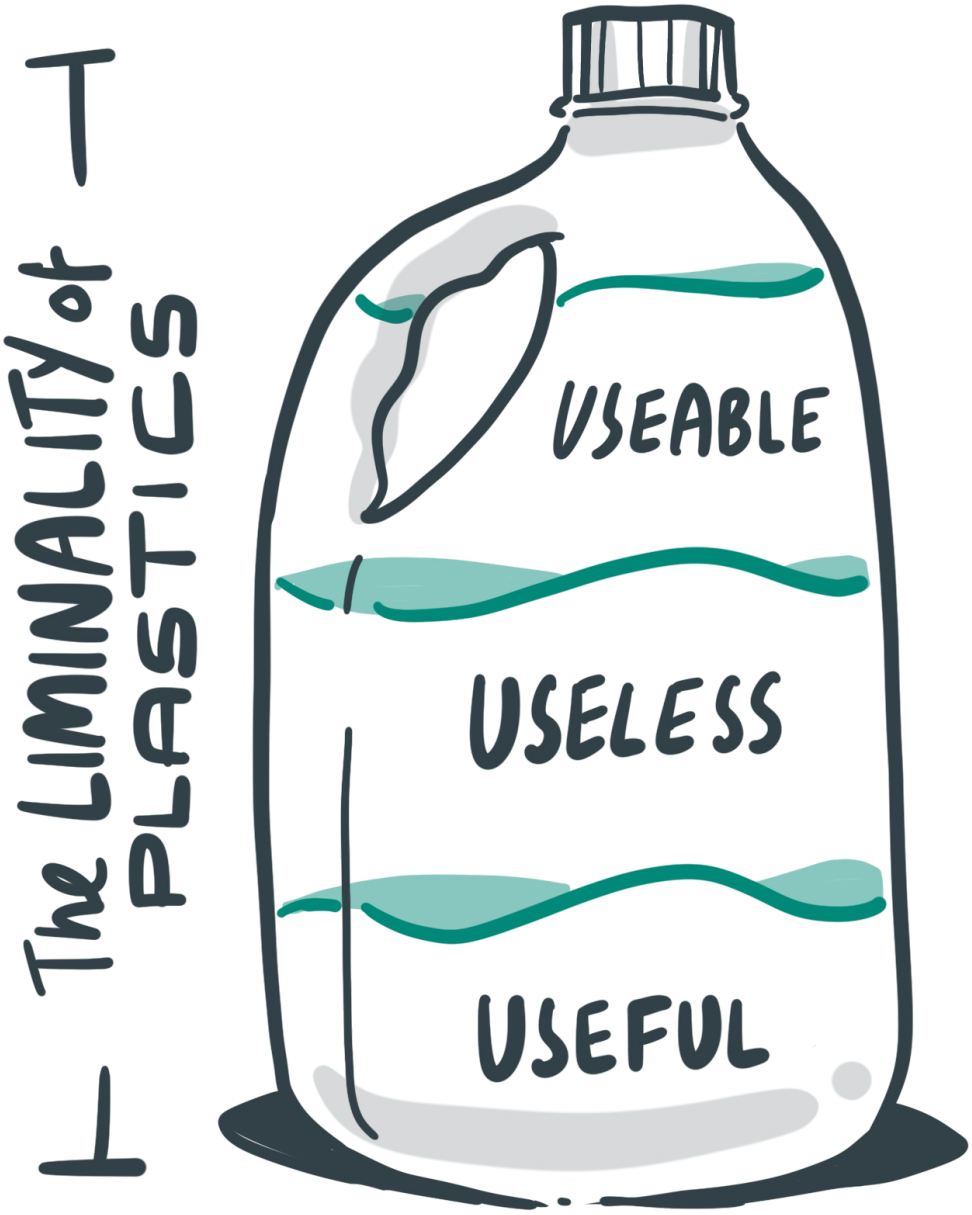
Whether a pedal bin at one end of the kitchen, a cupboard beneath the sink, a carrier bag on the back of the kitchen door, a designated section in the entrance hall or amongst shoes and coats in a utility room, many households have at least one informal place within their home that is used for storing recyclable packaging materials before they are disposed of via more formal pathways such as outdoor bins for kerbside collection or trips to a local recycling depository. We classify these informal, indoors places as liminal in the sense that they are intermediary space(s) between private household disposal activities and public sector waste management services.

"we've got like the small bin and the main recycling under the sink. And then there's kind of like a bit of space between the edge of the kitchen surface and the door. So, they're sort of kept behind the door. So, they're kind of like out the way."

"I've just got them into a habit of having a bag of bags. So, a carrier bag that collects other soft plastics of carrier bag grade."

Temporary storage spaces for plastic recycling

These liminal spaces serve as repositories for packaging items that no longer preserve or protect food but still hold recycling potential, and are treated differently from general waste. As such, the materials deposited in these liminal places are not necessarily "consign[ed]...to...limbo", they are momentarily placed in such places, which serve as a "halfway house" before they are transferred to their local council recycling collection bins (or local recycling collection points) at a later point[21]. They are sites of transformation, wherein plastic packaging 'passes through an ambiguous phase' and changes status, transitioning from useable to useless to useful.



To ensure that used up packaging can once again become useful, these items often undergo a cleansing process, whereby households "rinse" - or rid - packaging of dirt, putrescible substances, or contaminants before they are ultimately placed aside for recycling. Participants spoke of this cleansing process as a burden that needs to take place because of formal requirements from their local council recycling and waste management services:

"[the local council recycling leaflet] tells you that they expect it to be clean."

"The council are very clear that anything that goes into that particular bin has to be washed out...it's got to be cleaned out before it goes in."

"I think its preferred that it's been rinsed out first."

For many households however, rinsing their recyclable plastic food packaging is not solely about following prescriptive guidance, it is also a pragmatic matter of preventing unwelcome food odours and the dirtying of their domestic space from soiled, unwashed packaging. As the British anthropologist Mary Douglas explained, "Dirt offends against order. Eliminating it is not a negative movement, but a positive effort to organise the environment[22]". "Dirt" is more than something that can cause **physical** harm (i.e. infection, illness), it represents disorder or "matter out of place" - foreign objects that do not belong.

Household storage areas for recyclable food packaging are, in some respects, a border between the cleanliness and comfort inside of the home and the suspected dirtiness and discomfort of the outdoors realm where refuse and rubbish is banished. Household management of waste becomes a means of mitigating against **symbolic pollution**, that which threatens the order of the home.

Referring to a carrier bag of 'soft plastics' which she ordinarily keeps on the back of the door in her pantry before it is tied up and placed in her car boot when full, one participant expressed concern about the risk of unpleasant smells arising from unwashed materials:

"I wouldn't [wash] unless they-, I mean the cheese [packaging], something like halloumi, it's always got that kind of, we call it cheese juice [laughs] but you know that sort of whey type stuff that comes off there and...that carrier bag might sit there well, at least two weeks because I don't go to Tesco all that often, but it might be there for a month or if the bag gets full fast, [I] sort of tie it, put it in the boot of the car and start another one, but I don't want something [smelling]. Like last night we had a prawn pack. I don't want that to start going off and smelling of horrible off fish in my boot of my car or in my pantry, so I always wash them out quite well. I mean I don't go mad, it depends what the thing is. The cheese one, I'll just give that a quick rinse 'cause I just don't want it smelling of sort of going off milk hanging around."

Like the general waste bin that has played a key feature of domestic waste disposal activities for many years, these liminal places - carrier bags on doors, pantry spaces, the boot of a car - work as mechanisms to underpin the normality of recycling in everyday routine household activities. **However**, this is not to say that these mechanisms maintain the stability of households' informal recycling disposal practices, nor do they guarantee that recyclable plastic food packaging materials are treated in a consistent manner.

For several households, rinsing plastic trays, vacuum packing and the overwrap used to prepack raw meat and poultry products incurs **concerns about microbiological cross-contamination**, such as the spread of campylobacter, salmonella, or E. coli from "splashing" - biologic aerosols - to their hands, kitchen sink, and work surfaces. One participant took a photo of the potentially dangerous juices inside the plastic packaging of a raw chicken for her diary during the fieldwork. When talking about the types of single use plastics temporarily stored indoors before later removal to outside bins or disposal at specialist facilities, consumers told us that they ordinarily would not include the plastic film (overwrap) that covers raw chicken because of its potential to smell if left unwashed or to cross-contaminate oneself, dishes, or kitchen surfaces if rinsed.

Concerns about washing plastic trays for raw chicken

‘Wishcycling’

Wishcycling is the disposal of questionable waste in a recycling bin in the false hope that it might or should be recycled. Inappropriate items can contaminate the collection trucks and mills that handle specific recyclable waste, sometimes requiring entire batches of recyclables to be rejected. However well-intentioned consumers might be, depositing incorrect items in recycling bins can place pressure on local and national waste management infrastructures, increase sorting costs, intensify sanitation workers’ health risks, and result in overall inefficient recycling systems. The negative impact that these factors can have on governments’ overall recycling strategies is exemplified by China entirely halting the import of recycled material from other countries in early 2018, citing concerns about contamination from wishcycling.

For other households we spoke with, unpleasant smells and foodborne illness are not the only cause for reluctance when considering what to do with soiled packaging. Some described their **aversion to washing oily, fatty residues down their drains and disliked grappling with repellent substances**, such as the moist absorbent pads used to capture “weep” or “purge” from beneath raw meat products, and takeaway containers that are left feeling oleaginous to the touch from their contents. For others still, recyclable food packaging is often disposed of in the general waste bin because food residues are deemed to be too “messy”, “dried in”, or “awkward to clean”. In such cases, **withholding plastic food packaging from a household’s designated spaces for recycling is not always thought to be unreasonable**:

> “it’s sometimes quicker just to chuck it in the bin than to bother to ‘oh I need to know where this goes’, I need to sort it out, oh I need to rinse it’.”

> “I have a kind of aversion to washing up really greasy stuff. But it’s also the thing about pouring it down the sink as well. I don’t think we should be putting greasy, oily substances down the sink because then we end up with all the fatbergs and problems, blockages and the sewers and also all that. How is the wastewater treated and does any of that end up going out to the seas? But a lot of it is just, it’s to do with my likes and dislikes around getting my hands greasy and the washing up kinda thing.”

> “We throw our [cat food] pouches in the [general waste] bin. I think you can take them to some special recycling points that Teracycle do, but to be honest, I can’t be arsed to rinse them out because I think they’re gross! Sorry. It sounds really horrible to say but that’s how I feel.”

"Yeah, well with this particularly Chinese food it is a big effort to get clean. The rice is ok, but it's oily. It always comes in a really oily sauce and it sticks to everything... Even with washing up liquid and everything it takes ages to get through it. And then the oil ends up all over your washing up bowl and it's just a nightmare, you just end up spreading oil everywhere. So sometimes it's just easier to chuck it in the bin, which is terrible."

In these circumstances, household concerns about the inconvenience or disgust of purposefully cleaning "greasy", "gross", or "horrible" plastic food containers challenge the boundaries for what can be considered acceptable for recycling, regardless of official judgements from a material and waste management perspective. For others, meticulous cleaning is perceived to be a senseless burden and "clean enough" is better than nothing; that any surplus decontamination is the purview of the council:

"I'm like there will always be a certain amount of contamination on something, because **I'm not willing to wash a plastic ketchup bottle, for example, to the point I can see my face in it. If it's got a trace of really hard to get to ketchup that's just stuck right down in the bottom corner, it's going in the recycling.** And that is not going to cause them to throw the whole stuff off."

Key Learning 1

Socio-domestic issues matter.

Local councils' guidance about which food packaging materials can be recycled are mediated by social and domestic norms around maintaining a clean, ordered, and organised home.

The assessment of plastic food packaging as recyclable, whilst partly determined by what local councils communicate and facilitate, is influenced by households' perceived risk of real or "symbolic" pollution (i.e. disorder within the home), and the effort required to militate against that risk.

+ Consumers' judgements of what can and should be recycled differ to managerial and council definitions.
+ "Dirt" - odours and mess - can encourage rinsing of plastic food packaging and help support waste recycling processes, **however**, physical and symbolic determinants intervene:
  - **Physical:** Kitchen hygiene regimes can deflect from rinsing and recycling some plastic packaging.
  - **Symbolic:** Aversive responses to oily, soiled, or raw meat-related packaging can disqualify items from being rinsed and sorted into the correct bins.

Going with their gut: Assumptive barriers to recycling

For many households, recycling is an unreflective and habitual process ingrained in everyday routines and involves taken-for-granted assumptions. Consumers talk about a basic 'knowingness' as to whether certain plastic food packaging can be recycled or not. This awareness is often not premised upon any formal training, reference to specific guidelines, or local council communications but simply experiential knowledge:

"I don't know really, I just know."

"I don't even think about it most of the time. It's just I either know that it can be recycled or that it can't."

"You [just] get to know what's recyclable, don't you?"

"I realised I didn't bother looking at any kind of labelling. I'd make a decision, kind of a snap decision as to where the stuff went. So, all this stuff, except for, let's say that and this, that would probably go. The stiff stuff would go in the recycling. The floppy stuff would go in the landfill bin. And what did I base that on? Don't know."

Experiential knowledge is defined as "truth learned from personal experience with a phenomenon rather than truth acquired by discursive reasoning, observation, or reflection on information provided by others"[23]. This 'truth' for households is often premised upon **unarticulated lay assessments and personal heuristics** as exemplified by consumers who speak about "texture" or whether it **"feels like it's plastic"** when choosing how to properly discard food packaging.

Through tactile heuristics - or what have been referred to as **"knowledge in the hands"**[24] - consumers often make distinctions between "hard" or "sturdy" plastic food packaging, which they assess to be recyclable, versus "soft" or "flyaway" plastics which they falsely assume to be non-recyclable. Making tactile distinctions is often a highly subjective, unreliable judgement and what is deemed to be sturdy enough for recycling by one household may not necessarily be evaluated the same way by another. "Soft" items such as the polypropylene or polyethylene sacks, films, and membranes that fun-size chocolate bars, frozen vegetables, and breakfast cereals come bagged in tend not to be prioritised for recycling by some, treated inconsistently by others, and in many cases habitually discarded to the general waste bin without hesitation.

For some households, the tactile heuristic for judging non-recyclables extends to anything that is "flimsy" or "crinkly" and thus easily crushed or broken without much pressure, such as empty margarine tubs, single-serve yoghurt pots, or the trays inside chocolate selection boxes at Christmas time.

"Yeah, it's the crinkly stuff, you know like in a selection box, child's selection box, one that's quite bendy and thin. So that's plastic, can't recycle that. So, that's not what I would class as a hard plastic. So that's not something I would recycle. The only thing I would recycle is the outer [cardboard] box, literally and that's it, the rest will just go in the normal waste."

Beyond these tactile heuristics, households sometimes prioritise home assumptions over official guidance from waste management authorities leading to **'wishcycling'; the tendency to deposit items in recycling bins regardless of suitability because consumers assume, or wish, it will nevertheless still be accepted and recycled**. For example, having received local area notice that Tetra Pak cartons should be taken to 'bring banks' rather than left for council services pick-up, one HoH we spoke with continues disposing of these items in their kerbside recycling bins. Their household removes the plastic tops from fruit juice cartons, placing these with regular plastics disposal, and deposits the Tetra Pak remainder in their paper bin because it "feels" intuitive.

"Because I feel like the plastic can just go in the plastic and then the other is paper, so I didn't understand why they don't [accept]. But I thought if I separated it, they might take it. And I just feel bad putting it in the general waste...I feel like it could be recycled, and it seems like a waste of paper and plastic that could have been."

'Flimsy' or 'crinkly' plastics

Another household subordinates the guidance sent by their local council to their own judgements on what is suitable for collection and recycling.

"Sometimes with certain things...other councils accept it in their recycling. So, sometimes I am cheeky, and I'll include stuff that if somebody says to me 'oh my council accept that within the waste' then I'll just chuck it in."

Households also make assumptions about what happens to their recycling once collected. Lay understandings of local council recycling capabilities and where the boundaries of responsibility lie in the recycling process can engender unrealistic expectations about the fate of consumers' refuse once it leaves their homes:

"I'm not too precious about whether I get it right or wrong, by that I mean is it the right kind of plastic to go into the recycling bin. If I think it can go in a recycling bin I put in a bin and let the council worry about that. I mean I do it with some care, I don't want to say that I just chuck stuff in there willy nilly, but **I don't take each piece of plastic, look at the writing on it to try to determine whether or not it's appropriate to recycle or put it into the waste, I'll leave that for the council.**"

"If it's paper, cardboard, bottle or tin then I'm pretty confident that's recyclable. If its plastics, then I hedge my bets really and I suppose you always hear these stories that if you put something that can't be recycled in the recycling bin it contaminates the whole consignment and it all ends up going to landfill. **I don't really believe that. I mean I'd love to know whether it's true or not. But I also know that a lot of landfill gets filtered, you know, that it goes on conveyor belts and they actually pull out stuff that can be recycled from landfill waste**, from the general waste bins. So, I think well if they're doing that with the general waste, surely, they're doing that with the recyclable waste."

Experiences closest to the home - such as interactions and encounters with local bin collectors - have more of a lasting impact on some households' sorting practices than more distant communications such as government information and broadcast news. In this context, there is a reliance on the waste management infrastructure to examine carefully the contents of households' kerbside recycling collection bins and remedy any mistakes that could have been made, separating out the non-recyclable plastics from the recyclable plastics. To some extent, this reliance on waste management services to separate non-recyclable materials from recyclable materials is perpetuated through participants' previous experiences and engagements with local bin collectors.

"There's not a roadside collection if that's what you mean. So, yeah, a lot of people will probably think oh no its not going to go in the recycling [...] once I'd left it on my, in my front yard because I knew the binmen wouldn't recycle it, but someone had taken it and emptied it. And I don't know if that was a mistake by a new binman or something. They didn't take it in following weeks. But yeah, once it got emptied and they took them alright. But they haven't since. So, I just keep doing it myself."

"I've asked and asked and all I keep getting is they take them. And that's what the man said when I asked him about taking the plastic bag of plastic, he said yes, we'll take them. I said I'm not asking if you're taking them, I know you're taking them. It's what you do with them. Are you recycling them? And I don't think they know either really do they, the bin men."

"So, I know there have been times, its actually happened to me but I know its happened to other people where the bin men have refused to take recycling, they've said is got the wrong stuff in it and they've just left it behind. I always think well they'll do that, if I've really got it wrong, they'll do that. But it hasn't happened, so I carry on putting the majority of plastic in the recycling bin hoping that its right."

In these instances, households' continued reliance on and trust in the bin collectors to accurately and consistently inspect households' recycling bins on collection days deflects the burden of recycling beyond the home.

Key Learning 2

Experiential learning matters in recycling.

Consumers' "assumptive worlds" - the experiential knowledge they draw upon to formulate beliefs and orient their predictions about what will happen to their waste - have an impact upon the sorting processes that take place in the home. Judgements about which packaging and how it should be disposed of are underpinned by home assumptions regarding the "feel" of the material itself rather than by the infrastructural realities that local councils operate within.

Experiential approaches to household recycling have implications for educational efforts that seek to intervene in current recycling practices and improve recycling rates.

+ Consumers prioritise their own judgements about the types of plastic food packaging that should be recycled rather than the guidance provided by the local councils.
+ 'Wishcycling' continues despite local council guidance.
+ Consumers rely on heuristics when making judgements about what and how to recycle - touch and feel is a toolkit for evaluating materials for disposal.

Balancing home and work: Conflicts between occupational versus domestic lives

The boundaries between home life and work life are often blurred. Our data reveals that people's relationships with plastic are not exclusive to the home nor should they be viewed in a vacuum. Many of the households we spoke with included members who work in jobs which require significant consumption of single-use plastics for the dispensation of their duties, including healthcare, laboratory work, fire and rescue, and policing. Plastic-intensive occupational consumption was often considered to be at odds with one's private or domestic relationships with recycling and result in varying attitudes to and relationships with plastics generally. To some, such as one participant who has worked in laboratory settings, it was her occupational consumption of plastic that first sparked a change in her personal consumption.

> "...being a lab-based scientist, even back then, I was always conscious of the amount of plastic and waste [...] in doing the research that I used to do there's lots of different plastic plates that we use, 96 plates, 12 plates that you grow cells in and they're then thrown away and the tips that go onto pipettes, used to go through a lot of those and they get thrown away. And you can just see the amount of waste that was being produced as part of that research. It's not why I stopped doing research, but it does make you very conscious of how much [isn't] reused [...] I remember everybody was aware of it, but it was just the necessary evil for doing the research."

For others, the requirements of the workplace and one's occupational responsibilities within a particular role take precedence over personal attitudes towards recycling. This can lead to the suspension of normal recycling behaviour when at work and even the undertaking of more wasteful behaviour than a consumer might usually tolerate from themselves at home. Besides creating inconsistency in recycling habits, the sheer amount of plastic used in the dispensation of some work duties can lead to complacency, apathy, or "action paralysis"[25] when returning to home life and managing household recycling.

A university medical student we interviewed described feeling that whatever amount of plastic food packaging she recycles at home will only ever be a drop in the ocean when compared with the inordinate amount of single-use plastics she necessarily goes through without recycling during her duties at the hospital. She describes how steady quantities of plastic face masks, aprons, bibs, disposable gloves, hairnets, membranes for oxygenators, tubing, specimen cups, dialysis bags, catheters, syringes, finger prick kits, and drinking cups are binned every minute of every hour of every day at each hospital. When the traumatic scope of what is used and binned at work carries into domestic life, routine small acts like putting the right items in the right bins become characterised more in terms of their futility than any sense of making a difference.

Routine hospital waste plastics

Clear PVC bags and red soluble laundry bags for contaminated firefighter PPE

Beyond healthcare and laboratory-based work, police activities also require the regular usage and non-recycling of single-use plastics including disposable gloves, face masks, barrier tape, sharp item disposal kits, and almost all materials used to collect evidence. Similar concerns were expressed to us by those working in fire and rescue where consumables including disposable gloves and contaminant wipes are regularly used and binned following service to minimise health hazards of exposure. Protective gear exposed to fire - “dirty kit” - must also be sealed in disposable plastic contamination bags or plastic water-soluble bags for laundry decontamination. A fire and rescue worker we spoke with, describes the “bagging up” of contaminated PPE, while more wasteful of single-use plastics than many of this individual’s behaviours at home, as a necessary and unavoidable act undertaken to tackle firefighter health risks.

In terms of work protocols, particularly when they relate to matters of health and safety, many of the consumers we spoke with expressed that there was nothing they could do (or wanted to do) to change workplace reliance on single-use plastics. The occupational consumption of plastics is perceived as mandatory and beyond their personal choice, appears legitimate, and while recognised as substantial, tends to go unchallenged.

Besides the mandatory occupational consumption of materials to meet decontaminant policy, the work life of a fire and rescue operative, which can require living and bunking at fire stations, can also impact upon personal recycling practices. Fire stations, police stations, hospitals, and factories, where on-site recycling infrastructures may differ to what one is used to at home, can disrupt how a consumer regularly disposes of plastic food packaging waste. The mobile and reactive

nature of the work dictates that more packaged ready-to-eat food is chosen for meals when on shift. As a medical student describes in her diary:

"In preparation for the first sessions of med school running club tonight, I bought a microwave meal from Morrison's earlier this week. Just because its quick and there is very little washing up to do after, I can just bin the container and get straight off to running once I'm finished."

Quick and easy out-of-home microwaveable meal packaging

Because of the fast-paced and stressful nature of many work environments including those of emergency service workers and night-time economy workers, occupational reliance on convenience foods can become encultured. Although the fire and rescue worker we spoke with tells us that cooking from scratch is very important to her and that she is conscious of minimising single-use plastics at home, these values are disrupted or become much more difficult to execute when working in emergency services:

"...it does come with a certain style of living, and it comes with a certain [way of consuming]. The measure of space and what's achievable, what's affordable. What you can do in that. Your kitchen might be a galley kitchen. **It might not be salubrious enough to have a bin for everything**. [...] your pager goes off and you're like 'crap! Fire station time!'... I'm just going to grab a radio and nip to [supermarket] because I need something for lunch. My lunch plans for the day are now aborted, well I need something else... It might well be readymade food."

Furthermore, unsociable work hours required from emergency services can have a knock-on effect on the forms of consumption that take place back in one's own home. We were told how late shifts working in fire and rescue dictates a reliance on 'dashboard dining' usually facilitated by single-use plastics from pre-packaged 'petrol station meals' and takeaway meal orders. Rarely can any of the substantial amount of plastic packaging generated from convenience meals - including polystyrene containers, PET bottles, the metallised plastic film of crisp packets, or high-density polyethylene trays of microwaveable meals - be recycled by emergency workers or night-time economy workers when working shifts 'on the road'.

An emergency worker we spoke with feels that highly packaged convenience foods are more appropriate when she has been working "flat out" and do not require noisy preparation or cooking that could disturb others at a household she rents with others when returning home late at night:

> "And the other thing was if I worked late, I could be going to an incident and getting home late... if you were coming home late, particularly with a person who's house it was, you didn't do anything. You came through the front door, and you went straight to your room and that was it, because they weren't a late person, and they couldn't really cope with sort of appearing at one o'clock in the morning. And certainly not cooking late. ... [I] therefore **bought consumable food that I didn't have to cook, or ate on my way home, or used more takeout-styled food.** [...]"

By considering the interaction between consumers' professional and personal worlds, we can identify the interdependencies between different aspects of their respective lives and the direct effects these have upon their consumption of and attitudes towards single-use plastics. The possibility that workplace expectations, requirements, habits, and conditions spill over to more usage of plastic - or, apathy towards recycling - in the home is something that household members must consciously militate against.

Key Learning 3

The boundaries between work and non-work-related approaches to recycling are porous.

Besides emphasis on the home, attention should be given to plastic consumption at workplaces. Occupational settings not only produce waste streams that may be more significant than those from the household but are also venues where enduring norms and values are formed around recycling.

Although consumers may believe they are working hard to mitigate the gap between their intentions to reduce and recycle plastic and their enacted behaviours in the home, their efforts can be dampened by expected duties in the workplace.

+ Consumers have low perceived control over recycling at work.
+ Workplaces and occupational wastage of plastic become benchmarks that consumers compare and weigh their own household recycling against.
  - For some consumers, high wastage regimes at work diminish the meaningfulness of recycling at home, leading to apathy and inertia.
  - For others, high wastage regimes at work provide a 'wake-up call' and lead to compensatory commitments to recycling at home.

For sustainability to 'feel' important, organisations must visibly reduce reliance on single-use plastics when possible, facilitate recycling at work, and encourage employees to compartmentalise their occupational vs domestic consumption of plastics.

Playing second fiddle: Moral subordination of single-use plastics to food wastage

In the UK, the language of sustainability is inseparable from moralistic systems and moral discourses. Moralistic systems are "interlocking sets of values, practices, institutions, and evolved psychological mechanisms that work together to suppress or regulate selfishness and make social life possible"[26]. Within these systems as they pertain to waste, food wastage tends to be considered the ultimate 'sin' and thus, for many of the households we spoke with, is perceived to be far more reprehensible than any other form of wastage in the UK including flagrant and irresponsible misuse of single-use plastics. Approximately one-third of the food produced globally for human consumption is lost or wasted[27] and, in the UK, upwards of 70% of all post-farmgate food waste comes from the home[28]. Although food wastage, with its significant greenhouse gas (GHG) footprint[29], is undeniably an issue of global importance, the urgency to reduce plastic tends not to just become subordinated but is sometimes placed in contention to moral concerns about saving food.

"I still think in terms of [waste] primarily around food products because **food is a necessity**. I'm not speaking on behalf of the whole population, but I think certainly my view - and I do imagine its quite widely shared - is **that [people's] priority is more on the food, and the amount of consideration [people] give to the packaging probably isn't that great**. And again, particularly with the circumstances that we're in with the cost of living at the moment. "

For many of the households we spoke with, the reduction and recycling of single-use plastic products remains eclipsed by the perceived immorality of consigning food to the bin when it could otherwise be eaten, donated, or put to some productive use. A medical student tells us that when she volunteered at a COVID vaccination centre during the coronavirus pandemic she recognised single-use plastic waste was higher than she had seen in other healthcare environments, but she found herself becoming far more concerned about the wastage of food in the volunteers' breakroom:

"...when I worked over the summer, I worked at a COVID test centre and even in the back - where there's no potential COVID test patients, we were regularly tested, and it was a green zone - **we just binned everything**. Even, we got given little packets of coffee, milk, biscuits, things like that, everything that was put out during that day was just binned at the end of the day. And I had to do it. **I actually hated it** [...] I just think it's a bit silly really and there's no kind of like, if you look at the bigger picture it's not needed, it's just unnecessary. **So unnecessary waste is what annoys me more than anything, when you consider what people are going through**."

Multiple instances emerged throughout our data where consumers discuss being appalled or incensed by the thought of food that is fit for human consumption going to bins or being left to rot in landfills. Although many of the HoHs we spoke with considered themselves to be or would like to be 'anti-plastic', most conceded that plastic serves a purpose in lengthening the shelf-life and thus preventing food waste.

Reseal to minimise food waste

While single-use plastics are recognised as a regrettable and problematic part of their consumer lives, the wasting of food is forcefully criticised as an abomination.

> "**I absolutely abhor food waste**. I will always try and use stuff up and be innovative about what I'm cooking. [...] You know food costs a lot of money and a lot of effort goes into making it so I just don't ever think we should throw it away. Well, I don't have a food waste bin at my house, and everyone said well why not and I say well because **I just don't throw food away**. I really don't."

The **"abhorrence"** associated with the wastage of food rather than plastics can be partly explained by plastics being a relatively young and still fairly abstract substance in human civilisation and whose consequences thus remain obtuse for many. Food conservation, however, because of its centrality to our very survival, security, and cooperation assumes a level of priority unrivalled by other forms of consumption. Food waste we might consider to be a **"charismatic" challenge** because of its widespread recognition, vilification, and capacity to ignite anger, anxiety, and disgust at a scale disproportionate to other forms of wastage.

"Charisma" is a term most often reserved for people in reference to the magnetism of their personality, communicative capacity, or appearance and the power and attention it affords them. However, sociologists suggest non-human entities such as certain diseases, social problems, or material challenges can similarly accrue power and attention because of how they are popularly communicated and experienced[30].

The **'devastatingly charismatic'**[31] nature of food wastage is declared as wrong in many faiths practiced in the UK, whether in Biblical instructions for Christians ("And when they had eaten their fill, he told his disciples, 'Gather up the leftover fragments, that nothing may be lost'" John 6:12), the Quran's injunction in Islam to "eat and drink, but don't waste. Indeed, He likes not the wasteful", the Vedic verse (Annam na parichaksheeta...) instructing Hindus that not even a morsel of food shall be wasted, or the Talmudic concept of bal tashchit in Judaism, which roughly means "thou shalt not waste"[32].

Separately and secularly, the collective memory of the UK is punctuated by a litany of **food controls, food shortages, and rising food prices** combined with **"waste not, want not" and "belt tightening" thrift culture** tethered to national loyalty and

civic duty. The UK's cultural hangover from the food rationing measures of two world wars, the immediate post-war decades, and a succession of food crises in the 1970s, impart societal concerns that food waste is not only deeply irresponsible, but is potentially 'wicked'; a severe moral condemnation that has been further reinforced by recent influences from British popular culture. Live Aid concerts, televised news reports, and charities centred on famine and starvation relief throughout the 1980s, 1990s, and 2000s have embedded starvation at the forefront of the British social conscience.[33].

Furthermore, the **domestic experiences of food insecurity** throughout the UK during the 2008-2009 global recession, the subsequent years of austerity politics, mediatised images of 'panic buying' and empty supermarket shelves during the coronavirus pandemic, and the present cost-of-living crisis have **further fed the charismatic power of food waste**.

For HoHs, the sentiment remained clear that consumers while appreciative of the need to minimise usage and recycling of single-use plastics, are **most happy for those efforts to play second fiddle to mitigating food waste**.

> "what's kind of the lesser of the evils, is **food waste a bigger evil because there's so much energy involved in food production, food harvest, food transport?** So, to wrap like you say a cucumber, I'm trying to think what else you get, a swede or something wrapped in plastic, is it better to do that and increase the life of it and therefore reduce the food waste and all the associated things that go with that? Or is it better to avoid the plastic?"

Key Learning 4

Food waste is weighted far more negatively than plastic waste in everyday life.

Although managing food and plastic waste both require effective intervention, decreasing food wastage is given moral priority by households in the UK.

The UK's institutional memory is flooded with food crises, shortages, rationing, rising food prices, and austerity measures that work to perpetuate moral condemnations of food wastage, whereas plastic - in the absence of presenting as a significant crisis in previous UK history - remains a more abstract and secondary issue.

+ Food waste has been legitimised as an enduring problem in the British public consciousness for much longer than plastic.
+ Because of multi-faith and secular condemnations, food waste remains a "charismatic" challenge that attracts and monopolises power and salience in the public imagination.
+ The failure of plastic waste to incite the same kinds of anger, anxiety, and disgust as food waste may impede popular desire for intervention.

Food wastage's "charisma" is not likely to wane long enough for consumers to prioritise the management of plastic waste. For single use plastics to be treated as a complementary challenge to food waste, policy, the media, and both religious and secular leaders all share a role in elevating the moral reprehensibility of plastic waste.

Conclusions and Recommendations

This report highlights a variety of issues that households face when recycling plastic packaging. At the centre of this report is the argument that there is more than just a discrepancy - or 'gap' - between consumers' attitudes towards plastics and their enacted recycling behaviours. Although consumers do often behave contrary to the attitudes they purport to hold, their behaviours must be viewed at the level of the household rather than as purely individualised and of their own agency. Furthermore, households do not sit in a vacuum insulated from the outside world. Households are influenced by the:

+ occupations, social worlds, communities, and neighbourhoods of those who make up their members;
+ the cultural, moral, and socio-historic systems which influence members without ever being consciously thought about;
+ the many tacitly understood, unconscious, and embodied ways of behaving around food and packaging materials that are bred of habit.

There are various external factors and cognitive processes internal to the individual consumer bound up in managing multiple and competing identities, keeping a tidy and orderly house, and channelling or responding to normative and moral beliefs. Our findings show that consumers draw upon these factors to justify the gap between their attitudes and behaviours towards recycling plastic waste.

One of the initial areas of concern we identified is that while heads of households are generally interested in doing their duty to reduce their dependence on plastic packaging, recycle more, and live more sustainably, they feel that:

1. Plastic packaging is presently unavoidable when buying groceries for the household as it remains so present across food and drinks; and,
2. Recycling plastic packaging is confusing because of historically complicated and fragmented factors.

Recommendations

01

Continued simplification is required at national and local levels to minimise households' confusion around recycling.

At the time of undertaking our research, the UK government outlined proposals for a more standardised approach to recycling, which could potentially reduce the household confusion we detected concerning what can and cannot be put in certain bins. This new initiative has the potential to address the problem of 'wishcycling' we also detected amongst heads of households. **However, continued simplification is required at national and local levels to minimise confusion at the stage of recycling**.

02

Rubbish should be collected at least fortnightly across all council areas.

Households' management of waste plastic food packaging, whilst partly determined by what local councils communicate and facilitate, is **driven predominantly by pragmatic efforts to keep an orderly and clean home**. To overcome the 'messy' problems of keeping plastic waste in **liminal domestic spaces**, efforts should be made to ensure that rubbish is collected at least fortnightly across all council areas, helping households to avoid lengthy waits for smelly waste to be removed from temporary/liminal storage.

03

Recycling messaging should take into account the experiential learning that matters in household recycling.

Policymakers, producers, and retailers must recognise that experiential learning matters in household recycling: **consumer judgements about which packaging and how it should be disposed of are underpinned as much by tacit and unsaid assumptions regarding the "touch" and substantial "feel" of materials as they are by local council messaging.** Ensuring that simpler, practical recycling protocols that allow for all textures and consistencies of plastics (including flimsy packets, film tops, and supple plastics) to go into the same bin or bag will prevent consumer misjudgements and incorrect refuse. Consistent messaging that downplays the jargon of polymer sub-types and simply encourages that 'all thicknesses and types of plastics, regardless of feel' should be included in household recycling will alleviate consumers' apprehension about the recyclability of lighter-feeling packaging and boost the UK's packaging recycling rates on soft plastics and cartons.

04

Interventions must recognise that occupational settings influence recycling at home.

Besides simpler recycling, interventions must recognise that the occupational settings where members of households go to work are venues where enduring norms, habits, and values are formed that can stubbornly influence approaches to recycling at home. For several of the heads of households we spoke with, their rates of consumption of plastic in the workplace serve as benchmarks that they compare and weigh their household recycling against. **Household recycling cannot be viewed in a vacuum but must be facilitated in tandem with efforts to boost workplace recycling**.

Wastage regimes at work must be recognised for their potential to diminish the meaningfulness of recycling at home. Policymakers and employers have a duty to ensure that all workplaces not only sort their waste for recycling but that they integrate sustainability into their organisational cultures. Long-term efforts must be made so that all businesses, charities, and public sector organisations reduce on-site reliance on infrastructures such as vending machines and microwave ovens that build employee dependency on single-use plastic packaged foods. To ensure a reduction in the consumption of single-use plastics, the enhancement of sustainability efforts will need to overlap with improving dietary cultures and food security for employees. **Enculturing home-cooked meal preparation routines and ensuring adequate facilities for accessing fresher, less packaged foods will benefit efforts to reduce plastic consumption and enhance population health**.

05

Reducing plastic must also address food waste.

Interventions need to be developed in recognition that plastic is still perceived in the shadow of food wastage. **Efforts to decrease and decry food wastage are given moral priority by many households and when given the choice to bin plastic or bin food, consumers tend to feel more comfortable with the former.** Encouraging a reduction in the usage of single-use plastics and an increase in the recycling of plastic packaging must be carefully executed with consideration to the significant moral footprint that food waste has left in the UK. Although food businesses have complained that consumers unreflexively want plastic gone from their products and that their 'militancy' will lead to more food waste[9], our conversations with households reveal a more nuanced picture. The heads of households we spoke with expressed awareness about the high-levels of single-use plastics needed to preserve their food, and though some were willing to concede to this during a cost-of-living crisis, **the expectancy amongst most is that plastic reduction must occur without the penalty of food going to waste**.

Consumers demand the reduction of plastics but are not oblivious to food wastage which supersedes most other environmental concerns. Conversations about food waste revealed some of the most emotive language amongst households, suggesting food waste remains a much more "charismatic" challenge in the public imagination than plastic pollution. Much of the shared anger, anxiety and disgust attached to food waste in the UK likely connects to historic relationships with food shortages and both moral and religious condemnation of food waste.

The failure of plastic waste to incite the same kinds of negative responses as food waste may impede popular desire for intervention. Accordingly, 'moral champions' (e.g. policy, media, religious and secular leaders) must assume responsibility for elevating the moral reprehensibility of plastic waste. To reduce plastic while maintaining preservation of food, more needs to be done too in terms of the government's Extended Producer Responsibility (EPR). The more that can be done at the level of intervention before the consumer is involved in choice-making would assist in reducing the perceived burden placed on the household.

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