Consumer Perceptions of the Role of Packaging in Reducing Food waste

Pack Information Interviews

Insights Report

FIGHT FOOD WASTE Cooperative Research Centre
REDUCE - TRANSFORM - ENGAGE

Australian Government
Department of Industry, Science, Energy and Resources

Business Cooperative Research Centres Program

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Executive Summary

This report is a brief overview of the findings from Project 1.2.2 Packaging Design and Information Research which was conducted via online interviews in households. An overview of Project 1.2.2 can be provided on request. Project 1.2.2. aligns with the REDUCE and the ENGAGE programs of the FFWCRC's activities. The aim is to understand consumer's perceptions of food waste with a view to finding opportunities for packaging to reduce food loss and waste.

In summary the results show that there are highly complex issues and many contributing factors to food waste in the household. Improved packaging and labelling can play a role in reducing household food waste.

On pack information could be provided that allows consumers to make informed decisions on storage and reduce waste. However, as consumers become familiar with products, they rarely read the packaging so this would have to be on new products.

- Date labelling is reasonably well understood but consumers would like to see some consistency and certainty surrounding how it is implemented.
- People engage with on pack information differently depending on the food category.
- Discounted fresh food is seen to be of lesser quality and more likely to expire quickly.
- On pack nutrition and allergen advice is sought for new product purchases but not for subsequent purchases.
- Consumers use sensory testing (smell, look, feel) to assess food quality and make decisions about disposal. This could be supplemented by food waste reduction information.
- Consumers do not desire on pack storage information as they believe they already know how to store food.
- There are conflicting messages between instore storage and advice on packaging. This contributes to consumer confusion and poor storage decisions.
- Consumers would need to be prompted by other forms of communication that they need to engage with on pack information about storage and waste reduction strategies.
- Consumers have not made the conceptual link between food packaging and reducing food waste. The disposal of flexible packaging is an issue as it is a major contributor to household waste (not just food waste).
- Consumers want clear and easy to read information. They prefer colourful and visual information that communicates shelf life and storage conditions (e.g. refrigerate after opening).
- Portion controlled and serving size information is useful for consumers to decide what to buy. However, some of the serving information is 'unreasonable' in that serving size is kept deliberately small for the purposes of marketing of energy dense foods. Portions should be based on actual consumer usage and relate to number of normal sized servings.
- The quality of packaging materials should match the storage and transportation requirements. Some packaging contributes to food waste as it is not fit for purpose. This is especially in foods such as salads which use 'flimsy' plastics.

Solutions proposed by consumers

Education about

- Food storage, alternative used for leftovers and other food waste reduction is needed - ideas should not be only available on the packaging.
- The role that packaging has to play in reducing food waste.
- How to 'read' labels and packages to best effect for reducing food waste.

Using packaging and labelling to build on existing consumer knowledge structures

- Providing 'sensory' testing information on pack. Aids in decision making about food safety.
- Provide simple visual storage prompts (e.g. a snowflake symbol for food that can be frozen).
- Standardise format of labels to make information (e.g. contents, nutrition and allergens (CNA)) readily perceivable.
- Add food waste reduction information to labels next to the CNA data.
- Find innovative ways to supplement existing knowledge and help consumers with decision making about food (e.g. QR codes, instore notices – not ads).

Considering the differences between food categories

- Consumers look for labels about storage and food safety on dairy and meat but not on other products.
- Use labels on products to advise consumers about food waste according to the category (e.g. letting people know that 50% of bread is wasted so put it in the freezer if you are half way through the loaf).

Cluttered labelling and difficult to read layout and fonts

- Reduce the number of marketing objects on the package and provide relevant decision making information.
- Develop standardised guidelines for packaging and labelling that makes the consumer decision making task easier.
- Use visual imagery to convey ideas so that the message does not require English language skills or a magnifying glass.
- Use colours and symbols that convey the message (e.g. white for freezer, blue for cold, red for hot).

Clearly communicate the serving and portion sizes (based on real life eating patterns)

- Display number of serves on the package clearly to help consumers make decisions about whether a product will be completely consumed before its best-before or use-by date.

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Introduction

Food waste is a significant issue, both environmentally and economically (Devin & Richards, 2018). Good packaging is recognised as an inhibitor to food waste (Lockrey, et al., 2020). Though, the packaging itself is often viewed as having a negative impact on the environment (WRAP, 2017). Packaging is left over once a product is consumed and a consumer must dispose of it either in the bin or through recycling. However, in many cases packaging protects food and prolongs shelf life, with an overall reduction in environmental impact by reducing food waste (Wikström, et al., 2019). Food packaging can contribute to household food waste reduction by; being designed to extend the shelf life of food products; being available in numerous sizes for portioning of food for different sized households; communicating on pack the best way to use and store food items; and in assisting households to use food before it expires with date labels, in order to better manage their food and slowing the degradation of minimally processed food types (Wikström, et al., 2019). Understanding, perception and use of packaging by consumers also plays a role in household food waste generation. The negative perception of packaging and the lack of understanding of its purpose by households is likely to contribute to the less-than-ideal packaging used by households.
This project builds on previous research, being a:

1. Baseline literature review,

2. Baseline measure of food waste in Australia,
3. Journey mapping of food waste in Australian (Melbourne) households, and
4. Online survey of existing perceptions of packaging by Australian consumers

The reports supporting previous modules of research can be downloaded from the FFWCRC website. The aim of this module of the research is to understand the impact of packaging and labelling on consumer decision making about food. Food labelling plays a role in helping consumers reduce their household food waste (WRAP, 2017). However, there is a need for further investigation of the role of date and storage labelling on foods, and their impact on consumer food waste on a systemic level (Chu, et al., 2020).
This research explores the ways in which consumers use (or do not) use-by and best-before dates, and storage and other labelling to make decisions about purchasing and using food, and how these decisions might contribute to or reduce food waste.

The five main food waste group categories under consideration are (1) Bakery, (2) Dairy and Eggs, (3) Packaged and Processed (inc. processed meat and seafood), (4) Fruit and Vegetables (fresh), and (5) Meat and Seafood (fresh or frozen).

The key research question addressed is:

What are the labelling and on-pack impacts on consumer decision making?

02

Background

There are a wide variety of factors that influence consumer behaviours and food. These include consumer values, the challenges of everyday life, and managing stock in households (Hebrok & Boks, 2017). Further, the material properties of food and its packaging (Spang et al., 2019) also affect food waste in households. Food labels may contribute to consumer decisions when they are purchasing food, as well as when they are storing and using the food.

2.1.

The impact of labelling on consumer food waste

Much of the existing research has focused on the role date labelling plays in consumer decisions and practices that lead to food waste. Date and storage information on-pack has an indirect impact of packaging on a consumer's decision to eat or discard food (N. L. W. Wilson, et al., 2017). On-pack date labelling has also been found to contribute to consumer food waste (Chu, et al., 2020). For instance, research has suggested that the presence of a date label altered the intended disposal rate of milk (Roe, et al., 2018).
Date labelling on milk may lead to consumers discarding milk that is putatively past its consumption date, but that would otherwise be considered acceptable for continued consumption if consumers were relying only on their own sensory assessment (Roe, et al., 2018).

The type of date label has also been found to have an impact on food waste, with date labels that are suggestive of food safety concerns leading to a greater amount of food waste (N. L. W. Wilson, et al., 2017). Previous research has also suggested that consumers are either confused by the different types of date labels (see for example, Hall-Phillips & Shah, 2017; Neff et al., 2019; Newsome et al., 2014; Thomson, 2017) or that they have different conceptions of what different date labels mean (N. L. Wilson, et al., 2018). The relationship between the type of date label and the type of food has also been shown to change consumer perceptions and behaviour, with consumers responding differently to date labels depending on the product – for example, consumers said they were less likely to consume eggs past-date that were labelled 'best if used by', but more likely to consume deli meat and spaghetti sauce labelled similarly (N. L. Wilson, et al., 2019).

Several studies have explored the impact on food waste of either standardising date labelling (WRAP, 2017) or removing certain types of date labels altogether (Secondi, 2019). In the UK, food labelling guidance has recommended providing clear storage advice that, where possible, is supported by symbols or graphics (WRAP, 2017). Having standardised labelling – both text and graphics – for storage advice has also been recommended (WRAP, 2017).

2.2.

What consumers value on food labels

Previous research has found that consumers both value and look for date labels on food labelling (Aday & Yener, 2014) and report using labels both in store and at home (Lyndhurst, 2011). Further research examines information provided on food labels, and the ways this impacts consumer decision making – at least in purchase decisions. For instance, consumers value labelling that indicates the origin of the product (Ribeiro, et al., 2018) and use origin labels along with organic certification labelling and indications of production techniques to judge the 'authenticity' of foods (Chousou & Mattas, 2019). Nutrition information is also commonly valued by consumers (Aday & Yener, 2014; Ribeiro, et al., 2018), especially information about the fat content of the food (Aday & Yener, 2014).

It is not clear whether consumers value or use storage information on food labels. This may be because such information is not widely available and there are no global standards for labelling that would permit research in depth.

2.3.

Gaps in the existing research

A more holistic lens is needed to understand how consumers use date labels as part of their broader food practices (Chu, et al., 2020; Lyndhurst, 2011). There also needs to be translation of theoretical knowledge in the date labelling and food waste literature into designs that can be implemented by industry (Chu, et al., 2020). Previous research has focused on standardisation of labelling terminology. There are opportunities to expand this repertoire of research into how date and storage information influence consumers decision making about food. This research should include visual language and design or communication elements that enhance consumer decision making about food waste in the household. Chu and colleagues (2020) propose that both descriptive text for the different types of date labels be included, along with graphic illustrations that communicate product shelf life and storage instructions.
They also argue that packaging designers need to understand the existing sensory knowledge of consumers and develop sensory knowledge guidance into graphic marks or codes on packaging that allows consumers to access more detailed guidance through their mobile phone or other device. They also propose that technologies such as smart packaging be incorporated with conventional packaging design, rather than replacing conventional date labelling with these technological innovations.

This module of Project 1.2.2 aims to better understand the way consumers perceive and use on-pack information on food labels – including date labelling and storage information – and the role this on-pack information and the way it affects consumer decision-making might play in reducing household food waste.

03

Method

The module uses the online equivalent of in-home interviews about packaging that the consumers interact with already in their own lives, as well as examples of packaging that the research team has identified that may address issues related to household food waste. The in-home interviews were conducted virtually, via a secure online meeting platform. Participants were interviewed about on-pack information for foods across the five food categories identified in the earlier stages of the broader project:

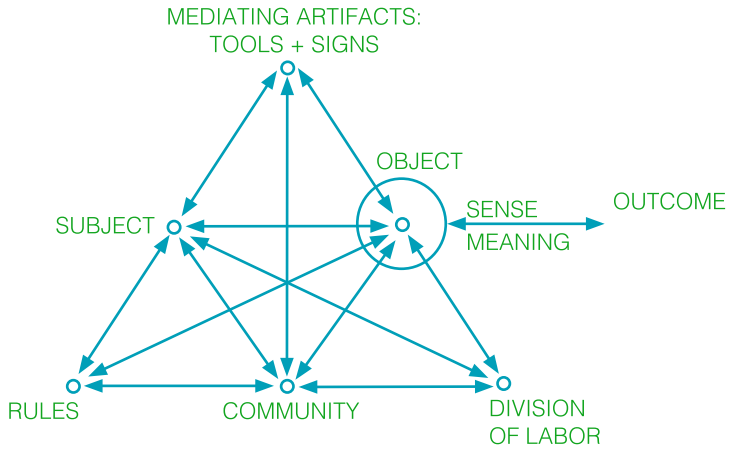
Food categories

1. BAKERY
2. DAIRY & EGGS
3. FRESH FRUIT & VEGETABLES
4. PACKAGED & PROCESSED
5. MEAT & SEAFOOD

A mixed method approach (Wisdom & Creswell, 2013) was adopted to allow for cross-validation between qualitative and quantitative investigations across Project 1.2.2. In order to develop an approach for the semi-structured interviews, we drew on existing literature, qualitative data from our study that mapped consumers' journeys with food and food waste in households, and quantitative data from our online survey of existing consumer perceptions of food packaging (reports available from the FFWCRC website).

Activity Theory is the theoretical framework for this study. This theory conceptualises human interactions with artifacts within the context of real-life circumstances as a system of interrelationships between six different elements: (1) 'Object' or central issues of the activity being considered, (2) 'Subject' or the particular activities considered, (3) 'Rules' or guidelines and limitations managing the system, (4), 'Community' or stakeholders involved in the system, (5) 'Division of Labour' or working groups, disciplines, and roles in which the actors perform, and (6) 'Mediating Artifacts: Tools + Signs', or instruments used by actors within the system that change with experience and knowledge (Engeström, 2005). Collectively, these function to produce a 'Sense or Meaning' that results in a mutual 'Outcome', as shown in Figure 1.

FIGURE 1



Activity Theory and its constructs (Engeström, 2005 p.30)

This method allows a direct understanding of how consumers think about and engage with labelling and on-pack information when they are making decisions about purchasing, storing, consuming, and discarding food items. It allows an assessment of these interactions and the interrelationships that exist between individual consumers, the packaging, and other elements that impact their decisions.

3.1

Research design

Recruitment of consumer participants and online interviews were undertaken by market research agency Wallis Consulting Group.
Consumer participants in Victoria were recruited to meet the following broad targets:

- Main or joint food purchasers/preparers
- Both female and male (2:1, female to male, as this is representative of the purchasing patterns)
- Reasonable cross-section, in terms of Australian/ Victorian population, age and income/ purchasing behaviour demographics, for those food purchasers/preparers aged 18 years and over (as far as was possible)
- 10 consumers in each of the five main food waste group categories. Each consumer was interviewed about a single category. There were 50 interviews in total.

The split of female and male participants was used because female household members have been shown to be more likely to be responsible for food shopping, meal planning and preparation (Flagg, et al., 2014; Lake et al., 2006).
With this small sample size, we aimed to gain deep, rich insights from a reasonable cross-section of the Victorian population, rather than statistically significant results.

The RMIT University research team developed a discussion guide for the 60-minute interviews that made use of stimulus materials. These materials were developed based on real-life on-pack information examples from the five food categories. The real-life examples were chosen based on findings from the earlier Journey Mapping qualitative study about consumers' general interactions with packaging while purchasing, storing or using food in their households. For instance, in the Journey Mapping qualitative study, storage was identified as a potential issue contributing to household food waste, as was packaging functionality such as resealability.
As such, real-life labels that included storage instructions or pointed to the resealability of the packaging. The discussion guide explored the following questions:

- What are the labelling and on-pack information impacts on consumer decision making?
- Does on-pack information help/hinder decision making?
- What/sort/how/why?
- What is the role of date labelling?
- What is the role of food date labelling and storage advice? e.g., messaging like keep in fridge, suitable for freezing, (see https://wrap.org.uk/sites/files/wrap/Food_labelling_guidance.pdf)
- What could be done better to reduce food waste?

Consumers were also asked to identify and provide investigators pictures of examples of on-pack information that they felt was helpful or otherwise useful for them, especially in using packaging to help prevent food waste in their household. Interviews with consumers were audio recorded and transcribed, and this data, along with images supplied by consumers, which in turn were analysed by the RMIT University team.

04

Results

4.1

Participant profile

There were 33 female and 17 male participants, of which 14 undertook interviews about bakery, 11 for dairy and eggs, 7 for fruit and vegetables, 10 for meat and seafood and 8 for packaged and processed foods. Participant ages ranged between 18 to 65, with the biggest group aged 25-35 (18 participants), and 39 were from Melbourne, 10 regional and 1 rural. 32 of the participants had university level qualifications, 10 vocational education and 8 who had completed high school.

4.2

Food label information

4.2.1

General use of food labels

The general sentiment among participants was that they did not usually read the information on food packaging in detail or very often, especially if the product was something they often bought – a staple food in their household:

> *"... I probably haven't ever read anything on that because it's just a staple item [flour] that I would add to other things."* (Female, 46-55yo, family household with older children at home)

> *"I rarely look at labels, except if it's a new thing. Like, something I've never tried before."* (Female, 18-24yo, married/de facto with no children)

> *"... I look at it a bit. I'm more focused on looking at the price of something, than I am what it says on the label."* (Female, 18-24yo, married/de facto with no children)

However, participants were more likely to read a label if the product was unfamiliar, they were searching for allergen advice or for particular nutrition information. In these cases, consumers said they would read food labels to help them make purchasing decisions.

> *"... it depends. If my current brand wasn't available, then I'd look at the calories per serve and all that sort of thing and compare and try and get mostly health-ish sort of items."* (Female, 46-55yo, family household with older children at home)

> *"... I do look at the labels for specific products. So things like fat and sodium, that type of thing."* (Male, 36-45 yo, single and living alone)

> *"... it's probably more the things that may be bad, or may not be good for me. So looking at things like chocolates or processed foods, and looking at some of the contents of those..."* (Male, 25-35yo, married/de facto with no children)

Another exception to this was date labelling. Many participants also said that they looked for date labelling when purchasing food. Across all five categories, participants who did look at on-pack labelling sought out nutritional information, ingredients, where the food was made – including country of origin, and the 'use-by' or 'best-before' date. Participants sometimes read the labels at home, especially when trying to make decisions about whether to eat a product or dispose of it. In this case, the information they looked for on the label was usually 'use-by' or 'best-before' information. For example, one participant said,

> *"... I'm pretty fastidious. Anything that's dairy, I do not use after its best before expiry date. And everything else, I'm pretty conscious of checking to see whether it's still going to be food that I will use beyond that date."* (Female, 36-45, single living alone)

One participant also said they looked at storage instructions at home:

> *"... when I do get home and get something that I will check and make sure that things are stored correctly because I do want things to last."* (Female, 36-45yo, single living alone)

Another said they looked at storage instructions on food, but that,

> *"I do think it's useful. I don't always follow it. It depends what it is... I would say I wouldn't follow it strictly, I guess."* (Female, 46-55yo, family with older children at home)

Within the food categories, those purchasing meat and dairy paid more attention to labels as they wanted to find the use by or best before date that best suited their intended timeline for when they would use the product.

Participants said they tended not to need to read the on-pack information about how best to store the food product. Instead, most believed that they already understood how best to store a particular food product or that they based their at-home storage decisions on where the product had been stored in the supermarket. This was the case across all food categories when the food was familiar to the participant. For instance, one participant said they would "probably not" look at storage information, saying,

> *"I have learned a lot about defrosting and freezing food and safety in regard to that. No, I think I feel fairly confident. It's not something that I will probably stop in the supermarket to look at and read."* (Female, 46-55yo, family or single parent with school aged children at home)

While another said they based their storage decisions on ***"general knowledge"*** (Female, 46-55yo, family with older children at home). However, a few participants did say that they might look for storage instructions either on-pack or on an internet search engine if a food was unfamiliar. The familiarity or otherwise of the food seemed to be a much bigger factor in looking at storage instructions than the type of food. One participant, who said they were between 60 and 70% confident in their general knowledge of how to store different foods said that if they did not know how to store a

> *"I might look on the package, I might also check with my mum."* (Female, 36-45yo, single living alone)

Another participant, who was confident about storage methods, and who also gained some of this knowledge from their mother, said that if the storage method they were using seemed not to be working, they would search online for a better solution. They said:

> *"... If it's something I'm not sure it's going that well [in the fridge or cupboard], then I'll look it up online. For example, recently looked up how better to store coriander because it lasts longer a different way, but if it's going fine because I'm using it within that week, then I don't research it, unless there's a reason to."* (Female, 46-55yo, living with adult sibling)

Some participants said they would like to see more instructions about different storage options – for instance, instructions for keeping the product at room temperature as well as for keeping it refrigerated. One participant suggested that there could be two 'use-by' dates on a product that indicated the shelf life depending on storage method. They said that the 'use-by' date might be,

> *"... the 25th of December if it's kept in the fridge, if it is refrigerated. And if it's not refrigerated then it might be sooner."* (Female, 36-35yo, single and living alone in Metro Melbourne)

4.2.2

Understanding of date labelling and ideas for improvement

Participants across all five food categories felt they understood date labelling and could define different date labelling terms with accuracy when asked.

Participants understood 'use-by' labelling to be the 'strict' date – that is, that the food could be unsafe to eat after this date. However, adherence varied depending on the food category. For example, consumers adhered more strictly to the 'use-by' date for meat, fresh fruit and dairy, saying it was best to either closely monitor or throw out the food beyond this date. One consumer, who referred to use-by dates as "strong guidance" said that if milk had passed its use-by date and also "smelled bad" they would throw it out, where another consumer said they would simply throw out milk that had passed its use-by date.

Again, in contrast to some of the existing literature (see for example, Neff, et al., 2019; Roe, et al., 2018; Thompson, et al., 2018; WRAP, 2017), consumers did not suggest date labels could be improved through standardisation, though many consumers said they would find larger and more prominent date labelling helpful. This speaks to the importance of understanding how use of date labels is interrelated to other consumer behaviours and perceptions.

There was also some variation in adherence, even for a food category such as dairy and eggs, based on a consumer's past experience with the product. For example, one consumer, who said they felt use-by dates were ***"mostly hype"***, said that,

> *"milk is something that might have a use-by date but it's still fine three, four, maybe five days later"* (Male, 56-65yo, living with their family, including older children in Metro Melbourne).

The 'best-before' date was understood to be a more lenient date, and consumers said they monitored food after this date but would still most likely consume it. For instance, one consumer said of 'best-before' dates, ***"I think that's a suggested date: it's not going to go off necessarily, but it's best before that date"***. They said that if food in their household had passed its 'best-before' date, they would ***"make a mental note to use it soon but I wouldn't throw it out"*** (Female, 25-35yo, living with their partner in Regional Melbourne).

Another said that a best-before date meant ***"you can still use it after that date, but it might've lost a little of its quality"***, and that if food had passed its best-before date they would check it more thoroughly each time, they went to use it (Female, 36-45yo, single and living alone in Metro Melbourne).

Although participants indicated a good understanding of the nuances of 'use-by' and 'best-before' date labelling, a few participants did use these terms interchangeably in general conversation about date labelling when they were not directly asked to define the meaning of the term.

However, there were some individuals who were very rigorous when it came to date labels. For instance, one participant said they were ***"very conscious about food poisoning"*** because they had had it once before, so they would almost definitely throw away something that was past its best-before date. They said they ***"might actually check to see whether I think it is before I waste it"*** but that it was ***"more than likely"*** they would throw it out *(Male, 36-45yo, family or single parent living with school aged children at home in Regional Melbourne).*

This particular consumer also said they read on-pack information on food, including looking for nutrition information they learned about during a course, which could indicate this consumer is particularly health conscious.

Many participants talked about using a *'sense test' of some sort* – ***"a bit of a sniff"*** or giving food ***"a squeeze"*** (Female, 36-45yo, single and living alone in Metro Melbourne) – in combination with the date labelling to decide whether they would consume food that was close to or past its date.

Participants talked about these 'sense tests' across different food categories. For instance, dairy and meat products would be 'sniffed', whereas bakery products would be 'squeezed' to check for freshness. Some participants said they did this with both use-by and best-before dates, where others were less likely to do this with foods that had a use-by date.

4.3

Perceptions of packaging and food waste

4.3.1

Food waste and packaging

Across all food categories, participants said they were aware of their food waste and that they made a conscious effort to reduce their own food waste. Many commented that their beliefs surrounding food waste stemmed from their upbringing and the current social focus on sustainability. One participant said, simply,

> ***"...we were brought up not to waste things."*** **(Female, 56-65yo, single person living alone)**

Another consumer referred in general terms to 'education', saying that this was what increased their awareness of food waste. They said,

> ***"Education I suppose, just from what you pick up and read and see about what happens to food when it breaks down."*** **(Female, 46-55yo, single parent with two older children and a school aged child at home)**

Some habits to reduce food waste included freezing food when appropriate, meal planning and eating food leftovers. Some participants also said they diverted food from the waste stream either by composting it themselves, or through a council food waste collection.

Across the segments, food packaging had varied reactions, however there was a general consensus that there was too much packaging of food. For instance, one consumer talked about twin packs of sweet potatoes that are also sold separately unpackaged in the same store, and another talked about fruit being sold in a four pack (Female, 25-35yo, living with their partner in Melbourne).

Another talked about ***"packets and packets inside packets"*** (though did not specify for what kind of food) and said, ***"there's no need for it"***. Another gave the example of tea bags, which they said, ***"come in a box but they come in packets in a box"*** (Male, 56-65yo, living with their partner in Regional Melbourne).

Some participants said they were 'pro-packaging', others were clearly 'anti-packaging', while some said they were neutral. Roughly half the participants expressed some 'anti-packaging' sentiments, though not all of these participants were hard lined about this.

Several talked about 'leaning towards' anti-packaging sentiments, but also recognising exceptions to this where the packaging was necessary to maintain product quality.

In the main, participants who labelled themselves as 'pro-packaging' understood the functionality of packaging and saw it as a convenient way to store their food and make sure it was safe to eat. Generally, consumers who mentioned they were 'pro-packaging' also said they were very aware of food waste and its causes in their household, and they often had children in their household. For instance, one participant said they were aware that a major cause of food waste in their household was their children, who are likely to forget food while they are playing, meaning it is no longer safe to eat later. These participants also often had measures in place to try to reduce their household's food waste. These measures were separating older and newer stock into different draws in the fridge, freezing, repackaging into smaller portions (and freezing), vacuum packaging of portions, using fridge or freezer bags to increase the shelf life of fresh produce, meal planning, using a shopping list, and using the compost bin.

Participants who communicated that they were neutral often had mixed feelings about food packaging, understanding it to be necessary for some foods, but still feeling some level of guilt about packaging waste. For instance, one participant said they were

> *"anti-packaging if it's wasteful" but "pro-packaging if it supports functionality, longevity and quality of product that's reasonable and sustainable"*
> (Female, 56-65yo, living with their partner in Regional Melbourne).

Those participants who suggested they were definitely 'anti-packaging' felt this way largely because of environmental reasons. Many of these participants mentioned plastic, in particular, as a negative aspect of packaging. Some participants who noted they were 'anti-packaging' claimed they were not very aware of food waste in their household or that they didn't consider food waste as being 'as important' as packaging waste or other environmental issues. Others, however, were very aware of food waste as an issue and tried to reduce it in their household.

Participants mentioned that they liked packaging which was clear and allowed them to see the food inside, as this assisted them in being able to see if the food was safe to eat. The perceived link between packaging and food waste was varied, as many participants had not thought of packaging to reduce food waste until the interview took place. Some spontaneously recalled reducing food waste as a benefit of packaging. However, many still viewed the waste produced by packaging (landfill plastic, etc.) as the main output of food packaging.

4.3.2

Ideas to improve packaging and labelling to help awareness of food waste

Several participants declared that they would like to see labelling that was easier to read, which meant that the text needed to be bigger and the fonts easier to read. Others suggested that date labelling could be clearer on the front of the package and the placement of labelling information could be consistent across all products so they would know where to look for it.
The inconsistency between labels makes decision making about products and purchasing aimed at reducing food waste very difficult for the consumer.

Despite many participants saying they did not usually read food labelling, many noted they would read instructions on packaging about reducing food waste or would find statistics about food waste motivating to reduce their own food waste. For example, including a sentence on labels such as “to reduce food waste…” and listing some simple instructions. Many participants also said including recipe ideas and preparation examples inspire them with ideas for how to use leftovers or how to use excess product when the portion size was larger than the consumer’s initial need.

Some consumers said using colour or bold text to help key information stand out would be useful. Similarly, some consumers suggested that labels should use icons where possible so people can see at a glance what they need to do in terms of storing or using the product. Icons should be simple visuals that convey the message quickly and simply. Some participants also suggested making smaller portion sizes available and/or clearly communicating on-pack how many servings there were in that package to help with avoiding over purchasing. For instance, one participant said,

> *“It’s really clear on the number of servings so it’s easy to work out whether I could reasonably use it all before the best before date.” (Female, 36-45, single and living alone)*

Resealable packaging was popular among consumers, and many suggested this as a potential solution for storage issues. Some examples given of food items that would or already do benefit from resealable packaging included tacos, wraps, yoghurt, and cheese. Participants said resealable packaging does or would allow them to store these items in the packaging they came in and help them avoid spoilage.

Many participants said they did not like packaging with too much “marketing”. One label identified as having too much “marketing” included a yoghurt label that included a list of ingredients it did not contain (including stevia, gelatine, artificial colours and preservatives). In this instance, the participant deemed this information distracting and unnecessary.

Some participants suggested less “flimsy” packaging should be used, for instance in the plastic packaging that is used with salad leaves and salad mixes. They deemed this packaging impractical because it tears easily and cannot be resealed. They said this made it more difficult to store the food correctly.

05

Conclusions

The results indicate tensions and complex interrelationships between several contributing factors to consumer perceptions and reported behaviour with on-pack information on food labels, and the potential for on-pack information to communicate important information that could reduce food waste. Consumers' use of on-pack information – date labels, nutrition information, storage information and cooking/use information – relates closely to their broader perceptions about packaging, existing knowledge of particular food items, access to information from sources other than the on-pack information, and the relationship between different types of information shown on-pack on the same label. This supports existing findings about the importance of a more holistic lens that understands the relationship between broader food practices and use of on-pack labels (Chu, et al., 2020; Lyndhurst, 2011), and arguments for developing food labelling guidelines that include explicit visual design language about how to present information in a way that would be supportive and useful for consumers (Chu, et al., 2020).

For instance, several consumers mentioned they would find instructions to reduce food waste useful on labels. However, many also noted that they only looked at on-pack labels for food products that were new to them, which would mean that this information would only reach consumers new to a food product. This presents a challenge to designers and retailers to create packaging label designs and other materials that would encourage consumers to engage with on-pack information more consistently, and not only for products that are unfamiliar.

Date labelling and nutrition information

In contrast to existing research (Newsome, et al., 2014) (Hall-Phillips & Shah, 2017; Neff, et al., 2019; Thomson, 2017), we found that awareness of date labelling was consistently high among consumers, and most seemed willing and able to make informed decisions about purchasing and using food in relation to date labels. This is also in contrast to our findings in an earlier research module, where consumers commonly talked about how either people within their household or other people that they knew were confused about date labelling (Brennan et al., 2020). This research contradicts other research (N. L. Wilson, et al., 2018), which showed that consumers' understandings of the meaning of different date labels was largely accurate. Many consumers also said they commonly looked at date labelling – though this was also dependent on both the size of the consumers' household and on the food category. Consumers reported being more likely to engage with date labelling for dairy and meat products. Consumers also make assumptions about expiry dates based on whether the labels have a price discount. It is assumed that a discount means that the date has expired or is about to expire.

Many consumers who looked at labelling for new products were specifically looking for nutrition and allergen information, which is consistent with existing research (Aday & Yener, 2014; Lyndhurst, 2011). These consumers might not necessarily engage with other information.

Consumers commonly reported using 'sense tests' together with reading date labels to make decisions about whether to keep, consume or discard food in their homes. This is also consistent with existing research (Roe, et al., 2018).

Any information related to reducing food waste might be best placed near or integrated with either nutrition or date labelling information, and formulated in a way that, as Chu and colleagues (2020) have also suggested engages with the 'sense test' practices consumers already use to make decisions about what to eat, keep or discard.

Storage knowledge

Consumers believed they did not need to read the on-pack information about how best to store the food product, with many instead saying that they already understood how best to store a particular food product.

Some consumers suggested that they based their at-home storage decisions on where the product had been stored in the supermarket. This is potentially problematic, particularly for fresh fruit and vegetables. For instance, in the case of berries and apples, the messaging on-pack is 'keep refrigerated', but apples are usually stored on ambient shelves in supermarkets, and berries are also most often stored on ambient shelves (though sometimes in the cooler shelves) in supermarkets. This means consumers could be dealing with conflicting messaging from the product placement instore and what the on-pack information says about storage conditions. This issue speaks to the need for consistency in messaging about ideal storage conditions (WRAP, 2017).

A handful of consumers said they actively sought out storage information – though not from on-pack communication. Some consumers said they asked family members (usually their mother) about storage, while others said they did a search online. This speaks to the importance of education programs that would disseminate storage information throughout the community and make that same information available in online locations.

It suggests that any use of storage information on-pack would likely need to be combined with education and information in other locations – including informing consumers that there is messaging on-pack to help them make more informed decisions.

Packaging and food waste – perceptions

Consumers did not make a link between packaging and reducing food waste, and often (though not exclusively) expressed 'anti-packaging' sentiments, similar to participants in existing research in the UK (INCPEN & WRAP, 2019). This speaks to the visibility of packaging for consumers once it has served its purpose – some consumers see packaging filling up their recycling bins, but do not necessarily make the connection that it has played a role in bringing food to their table in a safe way. This is an interesting dilemma for this project, and an opportunity for design and communications to play a role in helping consumers make this link.

The disposal of flexible packaging is also an issue for consumers who have very few options when it comes to recycling. Many suggested that flexible packaging makes up a majority of their household waste.

Useful aspects of on-pack information and consumer suggestions

Overall, consumers said they liked food labels that provided clear, easy to read information, and that used colour or graphics to help make that information easier to understand.
This supports findings in earlier research that guidelines are developed that include explicit visual design language about how and where to present information on-pack, and that this should include graphic illustrations to communicate shelf life and storage conditions (Chu, et al., 2020).

While existing literature identifies inappropriate portions sizes as a cause of household food (Wikström et al., 2018), some consumers suggested that number of servings per pack in conjunction with date labelling could help them make better decisions about what pack size to purchase.
This speaks to the importance not only of providing varied pack sizes to account for different household sizes, but also to communicating clearly how many serves are contained in those different pack sizes.

Consumers also made suggestions about the material qualities of the packaging, and its functionality that speak to the difficulties for industry in trying to find a balance between minimising the amount of packaging material around a product – for instance, light weighting for packaging on a product such as salad leaves, and the potential trade-offs in the capacity for that packaging to protect the food it contains.
Some consumers recognised the role of packaging in protecting food and complained that some packaging was not fit for this purpose – for instance, the consumer who suggested less “flimsy” packaging on salad leaves.

06

Insights

The insights that emerge from this research come under five key categories 1) consumer education, 2) industry engagement with consumers' existing behaviour and knowledge structures, 3) differences between food categories, 4) too much information on packs, and 5) effective and accurate communication of portion sizes:

6.1

Education

While consumers said that they would find instructions to reduce food waste useful on labels, the fact that many reported only minimal and quite specific engagement with on-pack information indicates the need for education that would help consumers understand that on-pack information can help them make informed decisions for purchasing, storage and usage, and point consumers towards this information. This is in line with earlier research that suggests that consumer education is an important aspect of the success of packaging in reducing food waste (Brennan, et al., 2020).

The education needed is two-fold. Firstly, consumers need to be educated that packaging has a role to play in reducing food waste, and about the various contributing factors to the environmental impacts of a packaged food product. This education would help to counter the anti-packaging sentiment some consumers expressed, and that has been reported elsewhere (Brennan, et al., 2020; INCPEN & WRAP, 2019). Secondly, consumers need to be educated to look for on-pack information that could help them reduce food waste.

6.2

Engaging with consumers' existing practices and knowledge

Consumers reported existing knowledge about how to store food, and how to decide whether food was still good to eat. Label designs that considered and engaged with existing knowledge, such as the 'sense tests' many consumers said they used, could be more likely to succeed.

Similarly, consumers also reported seeking particular information from food labels, such as nutrition information and date label information. Additional information on-pack that could help reduce food waste could be more likely to engage consumers if it was placed near to information that consumers are already seeking when they look at food labels.

Some consumers reported seeking out information, such as storage advice, that could help them increase the shelf life of their food and reduce food waste. They sought this information online or from family members. Future research needs to consider how to communicate to the general population in the appropriate locations information related to the role of packaging in reducing food waste.

6.3

Food category differences need to be considered

Consumers reported different levels of engagement with food labels depending on the food category. For instance, consumers were more likely to look for and pay attention to date labels for dairy and meat products. However, these categories are also likely to have less information available on pack – other than a useby date. Further use of labelling to decrease food waste could be considered in these categories.

6.4

Label design not contributing to "too much marketing" or overly busy labels

Many consumers had positive responses to food labels that presented information in a way that was easy to read and understand, and a negative response to food labels that were difficult to understand or included lots of text or used tiny fonts. Any guidelines that are developed for including on-pack information that could help consumers reduce food waste should include visual design language to ensure that food labels are easy to engage with and understand – for instance, presenting information with graphics where possible, or using colour or bold text to draw attention to key information.

6.5

Number of servings clearly communicated

Consumers – particularly those living in households with fewer people – said information about the number of serves in a pack was useful for them in making decisions about whether they would be likely to use the food before its best before or use by date. Food labels should incorporate this information, particularly if there are a variety of pack sizes available for that food.

07

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Find out more about the Fight Food Waste CRC.

08

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About this project

Understanding the perception and use of packaging by consumers and how this plays a role in household food waste generation is an important first step in this project. With a greater understanding of how people appreciate and use packaging, along with the food waste they generate, we can design improved packaging and communications on food waste avoidance that will ultimately reduce food waste.

This project aims to understand consumer perception of the role of packaging in reducing food waste by:

- discovering target areas that will help drive packaging design decisions.
- discovering key consumer behaviours that may be adapted to reduce food waste.

  determining potential consumer responses to labelling and packaging alternatives in relation to food packaging.
- providing formative information for partners' new product development processes.
- designing packaging to reduce food waste.
- designing more effective consumer education campaigns to reduce food waste.

The project Partners are

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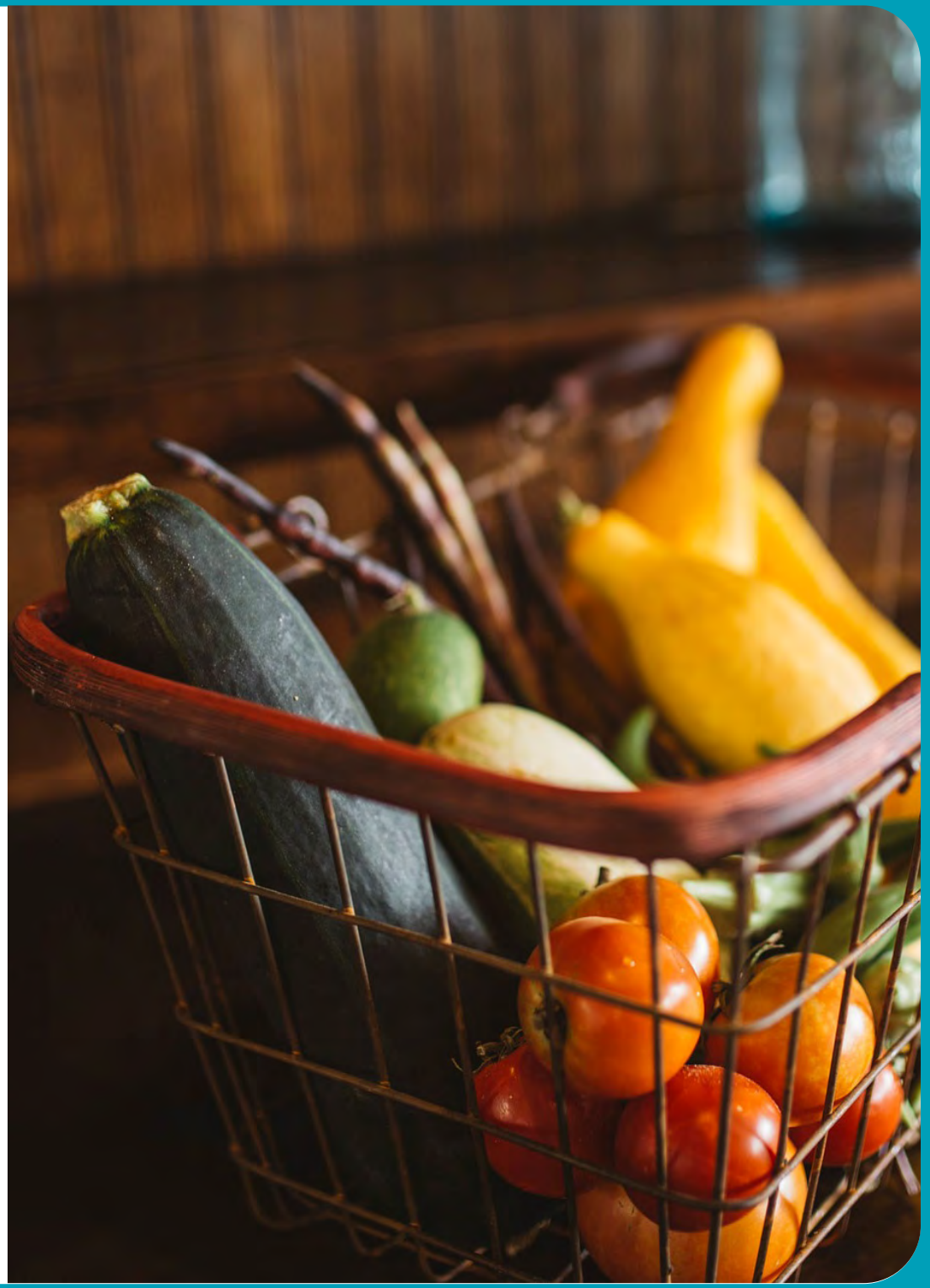

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