Practices of meat consumption and cold storage in Australian households

Consumer fridge behaviour and waste reduction of red meat

Insights Report A

Qualitative Research – Householder interviews & fridge rummage

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Executive Summary

Meat is one of the main items in food waste in Australian households with 140,300 tonnes of meat wasted per year (FIAL 2021). Households are attributed more than one third of the food waste (Arcadis 2019) in Australia and there is an opportunity to understand how to reduce this wastage. The use of meat in homes and how it gets wasted is affected by refrigerator performance and household practices around meat consumption. Household practices include how meat is purchased, cooked, eaten, and stored in the refrigerator, and how these domains interact. This project aimed to understand both refrigerator performances and household practices concerning meat to determine how meat waste could be reduced. Households in Australian cities and regions were recruited for a study conducted over Winter 2022 and Summer 2022/ 2023. Fridge temperatures were monitored in different sections of the fridge and practices were documented using interviews and ethnographic work. The focus on a combination of contexts and mixed quantitative and qualitative methods ensures that industry, government, and other stakeholders including MLA and FFWCRC can benefit from the findings. This insights report summarises the qualitative findings and recommendations. The findings include sites of intervention where the capabilities of householder practices of meat shopping, cooking, and storing can be advanced to reduce meat and other food waste. Furthermore, the dependence on freezers in saving money and food from waste, and the subsequent issues, such as buying multiple fridges and freezers, reduced quality of food/meat, doubling up of packaging (at retail and household level), calls for a larger scale and multi sited intervention than targeting individual household behaviour change or just technological interventions.

Introduction

Meat waste is one of the main food waste items in Australian households with 140,300 tonnes of meat wasted per year (FIAL 2021). Thus, there is a need to better understand household practices around meat consumption to reduce wastage. Furthermore, refrigeration is the main way meat is stored in households, which makes it important to study the connection between meat consumption and refrigerator use.

This insights report focuses on the qualitative aspect of a larger study that also involved a quantitative analysis of household fridge temperatures monitored by 'internet of things' (IOT) devices (details in Insight report B).

This qualitative project utilised semi-structured interviews with fridge rummages and photographic ethnographies of fridges to generate rich qualitative data about red meat storage and consumption in households.

Background

Food waste is an endemic issue in Australia. The Australian National Food Waste Strategy Feasibility Study has identified that Australian households produce 2.46 million tonnes of household food waste, which is 34% of national food waste (Arcadis 2019; FIAL 2021). Approximately 92% of household food waste still goes directly to landfill, which has significant environmental consequences, including air and water pollution, and loss of biodiversity (Arcadis 2019; FIAL 2021).

Reducing this waste could save the average family between $2200 and $3800 per year (Arcadis 2019). Furthermore, there is a difference between self-reported food waste and numerous bin audits conducted, indicating that more research is required that identifies this gap and its contexts.

The greenhouse gas emissions of meat waste going into landfill adds to the energy and resources of meat production and transport as environmental issues to consider (FIAL 2021). In order to reduce meat waste, there is a need for better understanding qualitative refrigerator performance in light of modern fridge technologies and energy efficiency standards, and householder practices concerning meat consumption and storage, and how these domains interact.

Method

- This pilot qualitative study was conceived as 'following' red meat consumption through intersecting practices and through household stories and narratives. The purpose was to explore how stuff classified as 'food' ends up as 'waste' by examining household dynamics and processes. Rather than focusing on generating generalisable results, a method was deployed to provide deep and rich insights that complemented the quantitative project work conducted in parallel.
- 20 households were interviewed twice over two seasons (winter 2022 and summer 2022/2023 – 16 returned for the interview in summer) to capture how meat and other food items were provisioned, stored, consumed, and sometimes became waste, in different conditions.
- The semi structured interviews were accompanied by a fridge rummage, which provided an opportunity for exploring how householders' fridges were organised. The fridge rummage method as described by Heidenstrøm and Hebrok (2021) is a rapid ethnography comprising participant observation and exploring the fridge contents and its organisation with participants and talking through how they manage multiple practices associated with refrigeration, such as storing groceries, especially meat and managing leftovers.

- Photographs of the fridges (either through online screenshots or sent by participants) were collected, as demonstrative and analytical data.
- The data collected from the interviews were analysed using thematic analysis (Braun and Clarke 2022), which involved identifying patterns and themes within the responses to questions asked. We analysed the interviews prioritising themes around everyday practices intertwined with meat consumption and waste.

For detailed Participant details refer to the final report.

Results

Many practices play a role in how meat gets wasted in the home. Our data illustrates what kind of relationships are formed that shape how food/meat gets wasted, despite householders a) acquiring knowledge from various sources, b) reflecting on their actions and c) organised behavioural and technological interventions.

Our results show that **saving food, especially meat from waste** is a reflexive practice for many householders. These activities illustrated certain skills and competencies, availability of specific materials and most of all revealed how householders thought about saving food, especially meat from waste.

A qualitative evidence base has been produced that provides detailed and varied ways in which meat is consumed and wasted in households, as well as connections to refrigerators and freezers and their role in meat waste. These are the primary findings:

1. Householders found saving food/meat from waste challenging but experimented with novel and established ways to save food, especially saving meat from going into landfill. This included feeding it to their pets and composting.
2. Freezers were used to save meat from expiring at the date noted on the packaging. Additionally, many participants bought meat on specials that was close to the expiry date to save money and for convenience. This meat was frequently stored in second fridges or freezers.

FIGURE 1

Leftovers glad-wrapped in one of the participant's fridges to be used based on their own generated knowledge of number of days it can stay in the fridge.

3. On the other hand, freezing meat was avoided completely by some participants. The quality of meat was regarded by some householders as reduced by freezing, usually in the form of freezer burns and may have led to binning. Some households did not have enough freezer space to bulk buy.
4. Managing leftovers from cooked meals and left-over deli meat (cold cuts) was found to be most challenging for householders.
5. Householders evoked cultural patterns and values in talking about food waste. Cultural practices and previous life experiences played an important role in how food/meat was wasted, or food waste was avoided.
6. Many householders were unaware of temperature variations in their fridges and tended not to blame the fridge temperature when meat or food was discarded. However, many participants noted the design of the fridge (deep, narrow shelves) prevented them from having a clear vision of their fridge, leading to forgetting some stored food items (for example, see Box 1).
7. The increase in prices of all essential commodities at the time of data collection had made many householders thrifty and more conscious about food waste. However, as this is a short-term study, no strong conclusions can be drawn from this.

Box 1.

HH16's experiences with meat waste and refrigerator design

HH16 is a busy householder, who manages the shopping, storage and cooking in the household consisting of 4 adults and one teenager. The household has 5 fridge/freezers including one not in use. When asked how she stores and uses meat, she explained:

> *The meats go in the vertical freezer in the other one … The fancy one. That goes in my main fridge. Yeah, because, you have to be in my face, so I remember to use it, yeah … If it's in my fridge, yes, because it's there, yeah. I'm not gonna go get—I'm not gonna go buy steak or mince and put it in the freezer and then get old from the freezer. No. I wanna use the fresh ones.*

When asked about the meat in the fridge being wasted, HH16 replied:

> *It [fresh meat wastage] has happened when I've forgotten about it. 'Cause the stupid fridge I have, honestly we've only had this one a year, and it drives me nuts. It's so deep—the shelves are so close to each other that everything gets pushed to the back and then you kind of like—and so when I clean my fridge out—which is every week—we clean our fridge every Sunday because Sunday night is bin night—so yesterday I cleaned it out. That's when it gets a thorough clean whenver everything goes out. So I, "Oh my God. Oh my God. Like, Oh my God, I forgot—I didn't even realize that was there." … all of that [leftover, bad meat etc.] goes in, I put it in the red bin [landfill bin].*

8. Householders acquired knowledge about how long to store food in the fridge and how to save food from waste in various ways, including from the packaging, from the internet and by lived experience.

9. Many householders were constrained from buying a new or larger fridge by the available space in the kitchen, or in the house, which they believed they required so that 1) they could store more food 2), have a 'fancy' fridge (for example, with a tv or smart fridge, or with a French door), 3), and/or reduce trips to shops. However, a few saw this space constraint as a positive as more grocery storage space would have meant more food waste.

10. Date labels were interpreted in many ways during shopping: as an indication of freshness, to ascertain how long an item could be stored for, and if near expiry (and on special) buying it to save money. Some experimented and used their senses to bypass date labels.

11. Packaging was also used in many ways: some participants acknowledged its capacity to keep food fresh, some discarded it immediately after getting home for better stacking and storage results, and some used it for obtaining information about the product.

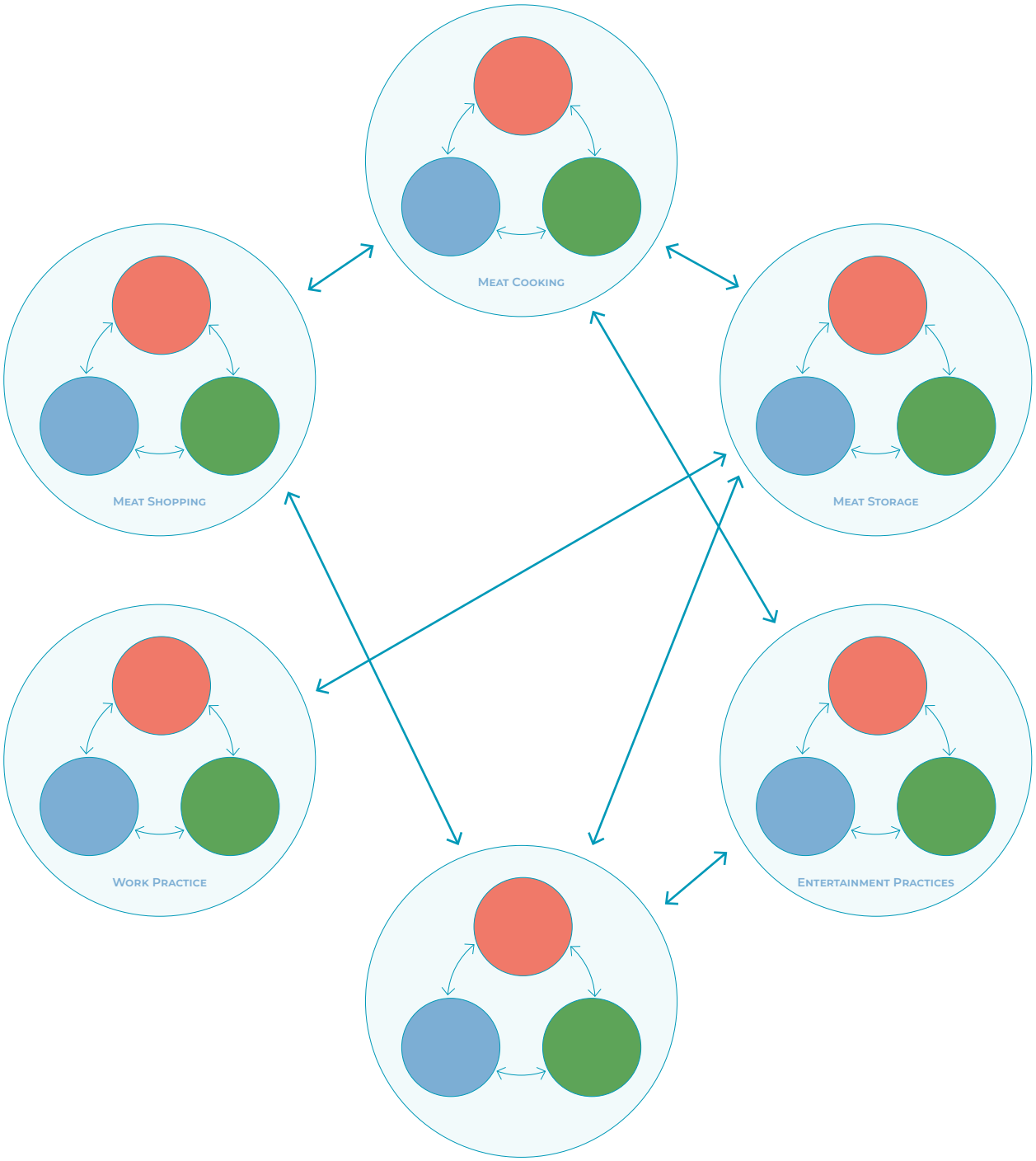
Conclusions

This study has elucidated some practices that are important in understanding how and why meat waste occurs, illustrating potential avenues for future interventions. The results illustrate how the practices around meat such as cooking, (cold) storage, shopping, and eating, as well as seemingly less connected practices of entertainment and work, interact (Figure 2).

- The freezer played a more important role than the fridge for householders to prolong the life of food/meat to save money and save food from waste.
- Refrigerators were a 'short-term' strategy for storage of food, and for many householders did not seem to play a role in reflexively saving food/meat from waste, such as adjusting the temperature dial. Further, the role refrigerators play, when not effective or efficient, in spoilage of food or energy consumption is either ignored by householders or absent in their understandings of food waste.
- Householders were more careful with meat than many other food items. However, perceptions about the type of meat (deli), status (for example, how it has been cooked), and quality (freezer burn) may have fast tracked the binning process.
- Bulk buying, buying specials or buying almost expired food, especially meat was usually done based on freezer space.

FIGURE 2

Following meat eating meant exploring the connections to various interacting practices that shaped and were shaped by meat consumption. Within each practice, the related meanings (red), materialities (blue) and competencies (green) shape each other.



- Learning over time how not to waste food, by experimenting, trial and error or through past experiences helped householders save food from waste.
- Despite attempts to save food from going 'bad', meat and other foods became waste as an outcome of everyday activities, priorities, and experiences (past and forecasted). These included care for children and family members, hosting or entertaining well, fear of food poisoning, look and smell of the food item, number of days in the fridge.
- Leftovers played an important part in meal planning and whether intentionally or unintentionally produced are contentious as food waste items. Sensory evaluation, time, type of leftovers (material, cuisine) all played a part in how long they are kept in the fridge before being binned.
- Date labelling or storage advice acquired meaning or became a part of meat shopping practice, when attached or connected to storage (fridge or freezer) or cooking (meal planning). As mentioned above, specials and date labelling were intimately connected.

Insights

In the fight for waste minimisation, "innovation and commercial ventures are the more promoted solutions" (Hobson 2020, p. 108). However, as we found, everyday activities are ripe for intervention. Our results clearly show the interwoven nature of household practices that both promote and minimise meat waste, which are again interconnected with the broader material, commercial and cultural aspects of meat and meat waste.

According to Evans (2014, p. 50), practices causing food waste 'are not readily amendable to the rational and deliberate models of intervention that policy makers and campaigners are currently deploying'. At the same time, saving food from waste is not merely about householders' attitudes, behaviours or choices that may result from better designed packaging or fridges. Similarly, this research has shown how various organisations and interrelationships of elements and practices either produce meat waste or prevent meat waste from happening.

This report has aimed to understand the effect of everyday practices and their interrelationships. More importantly the contexts of food and especially meat waste have been studied, where the interventions to reduce food waste may be applied. Similar to the WRAP UK findings (Quested et al. 2013), we have found that food waste is an outcome of a set of complex relationships. As a unique contribution and to provide an in depth insight into these complex relationships, we 1) focussed on meat consumption, instead of meat waste 2) explored the specific relationship between meat consumption and waste and refrigeration and freezing practices.

Recommendations and future research pathway:

Following these findings, we have collated some recommendations and interventions that may help reduce meat waste at household level. These recommendations are premised on the notion that merely informing householders about food waste is not an adequate strategy to bring about change in everyday routines and activities. Interventions that enable change within the complex and interwoven lives that people live are required, as current models are not designed for multiple, complex behaviours (Quested et al. 2013). Therefore, these recommendations are relevant to key stakeholders, including policy makers (food, community building, urban planning, education, waste); product designers; product manufacturers; packaging companies; food and red meat retailers; retailers of ready to eat and pre-portioned meal ingredients; online meal subscription companies; peak bodies; and urban studies and food researchers (For more details refer to final report).

- Support delivery of adequate walkable shopping options for everyday shopping to avoid overloading of fridges.
- Support the reduced dependence on freezers as a societal goal.
- Encourage improved manufacturer practices such as product stewardship. For example, encourage management of fridge through manufacturer's continuous engagement with the product.
- Engage community in innovation and rethinking fridge design, layout, and size in relation to fridge and freezer capacities.
- Undertake industry research with community participation on the capacity of 'sniff' tests to determine freshness. This could include the use of chemicals in meat processing that may disrupt or enable sensory evaluation.
- Multi-dimensional interventions: encouraging work, school, and university eating areas to provide refrigerators, freezers, and microwaves for the use of leftovers.
- Encourage and support reduction of the use of processed meat, especially refrigerated, through other means of meat preservation and provisioning.

- Integrating advice to create trust in a single authority that can provide tailored and specific advice as a one-stop advice platform for storage and use of stored products advice.
- Shared consumer - manufacturer responsibility to communicate the correct fridge temperature for storage for optimum shelf life
- Integrating and streamlining different packaging instructions and date labels (through peak bodies).
- Including considerations of multicultural attributes of the population in advice on the life of food and storage (for example, specific food items may not be handled in similar ways in different households).
- Tailor smart fridge technology and design with consumer practices of fridge and freezer use through co-design processes.
- More qualitative research into methods to challenge societal norms such as over catering, elevated hygiene due to COVID-19 and risk of food poisoning, which address questions of 'what is enough food for parties?' and 'what kind of food stays better for long in the fridge?'

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Find out more about the Fight Food Waste CRC

References

Arcadis 2019, *National food waste baseline – Final assessment report*, Australian Government's National Environmental Science Program, Mebourne.

Evans, D 2014, *Food waste: home consumption, material culture and everyday life*, Bloomsbury Publishing, UK.

FIAL 2021, *The National Food Waste Strategy Feasibility Study – Final Report*, The Food and Agribusiness Growth Centre, Australia.

Heidenstrøm, N & Hebrok, M 2021, 'Fridge studies – Rummage through the fridge to understand food waste', *Appetite*, vol. 165, p. 105321.

Hobson, K 2020, ''Small stories of closing loops': social circularity and the everyday circular economy', *Climatic Change*, vol. 163, no. 1, pp. 99-116.

Quested, TE, Marsh, E, Stunell, D & Parry, A 2013, 'Spaghetti soup: The complex world of food waste behaviours', *Resources, Conservation, Recycling*, vol. 79, pp. 43-51.

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