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The Evolution of Urban Australian Meat-Eating Practices

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This qualitative study used social practice theory to explore how meat-eating practices are changing in contemporary urban Australia, drawing on a sample of Sydney residents aged 23–45 years. The research used an iterative study design and an inductive analysis approach. Semi-structured face-to-face in-depth interviews were the main mode of data collection, supplemented by observations in places such as markets and local neighborhoods. Research participants explained that the role of meat in their diet has changed in response to shifting conventions and social infrastructures. They have reduced consumption of red meat in favor of meats considered healthier or more ethical. Key factors driving the change include exposure to alternative eating practices brought about through changes in political policy and the advent of globalization. Changing discourses of masculinity and the move toward embracing more fluid representations of gender have, in turn, changed meanings in relation to the meat-eating man and a meat-heavy diet. Rising environmental and health consciousness, and concerns for animal welfare have also contributed to dietary changes. While several participants claimed to have increased their consumption of plant-based foods, meat still continues to maintain a significant presence within their diets. Many participants expressed interest in cutting back further on meat consumption and adopting more plant-based foods but they also identified several challenges—e.g., limited access to plant-based ingredients and recipes, negative meanings associated with vegetarian and vegan diets, and a lack of competence in relation to preparing and consuming appetizing meals using plant-based foods.

Keywords: social practice theory, urban Australian trends, meat consumption in Australia, ethical eating in Australia, plant-based diets Australia, flexitarianism Australia

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INTRODUCTION

Australia has one of the world's highest levels of meat consumption, with a yearly average of ~95 kg per capita (OECD, 2019b). In comparison, the global average is roughly 35 kg per capita (OECD, 2019b). Meat has been a staple part of Australian diets for as long as the continent has been occupied by humans. Indigenous Australians hunted native game and seafood for inclusion in a varied omnivorous diet (Pascoe, 2014). Previous work on the history of colonial Australia reveals that following on from the European colonization, meat was largely sourced through cattle farming (McMichael, 1984). This made meat a relatively accessible and inexpensive commodity (Chen, 2016). In the book, "Vegetarianism in Australia—1788–1948: A Cultural and Social History," Crook (2006) claims, that since the middle ages, the British colonizers had associated meat eating, particularly beef, with social status. Thus, immigrating to a land where meat was accessible and

abundant encouraged meat-eating, whereas in comparison, a plant-based diet was associated with poverty and low social status (Crook, 2006). In this regard, understanding the historical trajectory of practices can help shed light on "ideas of what is normal, good and appropriate today" (Kuijer, 2014, p. 41).

Recent research in Australia indicates that meat continues to be viewed as necessary for a healthy diet (Marinova and Bogueva, 2019), and meat tends to be associated with terms such as "iron," "protein," and "staple dietary requirement" (Bogueva et al., 2017). Other research has shown that meat eating is often linked with masculinity (Ruby and Heine, 2011; Rozin et al., 2012) and with power, strength and virility (Potts and Parry, 2010; Adams, 2015). For many Australians, meat eating is also synonymous with social occasions (Bogueva et al., 2017) such as enjoying a meat-based meal with friends and family (Worsley and Skrzypiec, 1998). At the same time, many Australians consider plant-based diets, in general, to be nutritionally inadequate (Bogueva et al., 2017; Malek and Umberger, 2021). Some even label plant-based eaters as being "wimps" and not "macho" enough (Lea and Worsley, 2002). To this point, a recent newspaper article also reports that Australian vegetarians claim to feel bullied by meat eaters, who represent the cultural norm (Wood, 2016). Such views were also reflected in a study among plant-based consumers in New Zealand (Potts and Parry, 2010) as well as in Potts' more recent work on the role and meaning of meat in contemporary Western culture (Potts, 2017).

However, the narratives around meat eating in Australia also appear to be gradually changing. A recent study by Malek and Umberger (2021), comprising a nationally representative sample of Australian food shoppers, revealed that almost 20% of the sample identified as meat reducers. Furthermore, a large majority (87%) of the meat reducer segment reported consuming a meat-free dish as their main meal at least once a week (Malek and Umberger, 2021). These numbers are also reflected in another recent study of Australian consumers, where close to 20% of the sample of identified as flexitarian (Estell et al., 2021). Other work on Australian consumption patterns has found that key factors influencing food purchase decisions include price, health and nutrition, taste, country of origin, and food safety (Malek et al., 2019). In addition, semi-vegetarians, as compared to unrestricted omnivores, tended to place significantly more importance on factors like animal welfare and the environmental impact of individual food choices (Malek et al., 2019).

Other data on Australian meat-eating trends indicate there has been a shift from red meat consumption to white meat consumption (OECD, 2019a) for predominantly health related reasons (Taylor and Butt, 2017). Some of these shifts can also be attributed to dietary recommendations from Australian health authorities, who have encouraged people to cut back on red and processed meats (National Health Medical Research Council, 2013) and call for an increase in one's intake of fruit and vegetables (Pollard et al., 2009).

This paper draws on interviews with urban omnivores to explore how meat-eating practices are evolving in Australia in response to environmental, health, and animal welfare concerns. It uses the lens of social practice theory to examine the dynamics of meat-eating practices.

When it comes to identifying factors that influence meat consumption (Allen et al., 2000; Lea and Worsley, 2001; Forestell et al., 2012; Ruby and Heine, 2012; Milford et al., 2019) and strategies to reduce meat consumption (Apostolidis and McLeay, 2016) several studies to date have used behavioral frameworks that focus largely on individual consumption behaviors. While the focus on individual consumption can be helpful, Jaeger-Erben and Offenberger (2014, p. 166) claim this approach can also be considered as only a "top of an iceberg" understanding of the everyday practices of consumption. Other work similarly highlights that an emphasis on individual consumption means there is potentially a disconnect from more integrative approaches which also take social context into account when it comes to understanding food practices and behaviors (Atkins and Michie, 2013; Graça et al., 2019).

Social practice theory has received growing attention from scholars to address approaches that focus largely on individual attitudes and behavior change (Reckwitz, 2002a; Shove and Pantzar, 2005; Warde, 2005; Shove, 2010). Social practice theorists focus on the interplay between agency and structure (Shove and Pantzar, 2007). They consider the "'context' and the practice as inextricably bound" (Kurz et al., 2015, p. 116) and highlight how individuals and macro forces come together within the dynamic unit of a practice (Hargreaves, 2011). In this regard, social practice theory is well-placed to explore the evolution of eating practices over space and time (Shove et al., 2012).

A practice itself tends to be an assembly of "images (meanings, symbols), skills (forms of competence, procedures) and stuff (materials, technology) that are dynamically integrated by skilled practitioners through regular and repeated performance" (Hargreaves, 2011, p. 83). Our study draws on work by Shove et al. (2012), who define a practice as comprising three elements: competences (skills and know-hows), meanings (imagery and symbolisms), and materials (tools and technology). Attending to the elements of a practice also focuses attention on how changes in the elements contribute to the evolution of the practice over time (Shove and Pantzar, 2005).

Considering the example of eating from a practice perspective, materials are the tangible physical elements that are integrated into the practice (Ropke, 2009). These include not only food resources that are transformed or used up as part of the practice, but also things like eating utensils, recipe books, and the physical spaces in which eating actually takes place (Shove, 2017). Competence is the practical knowledge or skill required to enact or perform the practice, which may be conscious or unconscious (Shove et al., 2012). Important eating competences can include knowing how to shop for ingredients, how to prepare ingredients, and how to find and follow a recipe. Meanings are the perceived norms and conventions that underpin certain practices (Strengers, 2010; Shove et al., 2012). The meanings associated with food go beyond the utilitarian goal of meeting physiological needs (Arbit et al., 2017) as they are also tied to shared histories and broader social norms. Each time a practice such as eating is carried out in different settings, different combinations of elements—materials, meanings, and competences—are brought together and, in turn, shape the nature of the practice (Shove and Pantzar, 2005).

MATERIALS AND METHODS

Our qualitative exploratory research study encompassed the following research questions:

- What meat-eating practices are prevalent in urban Australia today?
- What is influencing the changes to urban Australian meat-eating practices?
- What role do particular elements play within the contemporary urban practice of meat-eating, and how are those roles changing?
- What opportunities for reducing meat consumption in Australia emerge?

To date, many studies on Australian attitudes toward meat consumption have been quantitative in nature (Lea and Worsley, 2001; Lea et al., 2006; Bogueva et al., 2017). Previous research highlights some of the limitations of using quantitative approaches when it comes to understanding attitudes and behaviors in relation to meat consumption (Piazza et al., 2015; Kunst and Hohle, 2016; Pohjolainen et al., 2016; Buttlar and Walther, 2018). Some of these include an overreliance on predominantly correlational methodologies (Piazza et al., 2015), which can be limiting when attempting to understand the nuances and complexities of meat consumption (Pohjolainen et al., 2016). Other work has indicated that such studies often occur in contrived environments, which may not represent what occurs in the real world (Rothgerber, 2014). Thus, as Sijtsema et al. (2021) highlight, despite recent and growing focus on meat consumption and meat reduction, there is an opportunity for qualitative, interview-based research to provide deeper insight and understanding.

Our study drew upon constructivist grounded theory and used an iterative data gathering process (Nath and Prideaux, 2011). Through semi-structured face to face interviews, there was an emphasis on gathering rich and descriptive data (Charmaz, 1996), which was helpful for gaining a deeper understanding of meanings, conventions, histories, and values associated with practices (Hitchings, 2012; Browne, 2016). Furthermore, as the practice of eating is conducted multiple times per day and often involves a high level of sensory input, we expected that participant reconstructions of their eating practices would be more accurate than for less mundane and frequent practices. Each interview was ∼60 min in duration and was audio-recorded with the participant's consent. Reflective notes, which captured ideas and insights, were written during and immediately after the interviews.

In addition, observations were used to corroborate and validate what participants had reported in the interviews (Patton, 2002). This involved visits to public places like restaurants and local neighborhoods to observe and record practices while they were being performed. Photographs were also taken as they helped capture the material environment and objects that were important elements of eating practices (Collier, 2003).

Participants

The sample for our qualitative study was informed by previous insights on meat-eating in Australia. Our study focused on young urban omnivores. This is in light of the fact that a significant majority—about two-thirds—of Australia's population live in capital cities (Central Intelligence Agency, 2018). We therefore sought our sample of meat eaters from a capital city, and chose Sydney for convenience. Given one of our key aims was to also explore how Australian meat-eating practices are changing, our sample focused on younger people. This is in view of previous research that indicates younger consumers are generally more open to experimenting with new practices (Brandtzaeg and Chaparro-Domínguez, 2020) and seek variety in their food choices (Poobalan et al., 2014; Higgs and Thomas, 2016; Stok et al., 2016). Our sample comprised participants aged 23–45 years. This age range comprises close to half the population of Australia's capital cities (Australian Bureau of Statistics, 2016b).

Previous work on Western meat-eating practices also reveals that men are more likely to follow omnivorous diets (Gale et al., 2007; Ruby and Heine, 2012). As our study aimed to identify opportunities for reducing meat consumption, it was important to find willing participants who were omnivores and understand their meanings and motivations in relation to meat-eating. Thus, although the final Australian sample (15 men 7 women) was different to the relatively even gender balance in Sydney, it was consistent with our research objectives.

While other factors such as family influence (Lea and Worsley, 2001, 2003; Bogueva et al., 2017) and perceptions of health and nutrition (Marinova and Bogueva, 2019) also tend to shape meat consumption in Australia, our qualitative sample focused on gender and age as these are key criteria which influence meat-eating. In this regard, our sample reflected exploratory qualitative studies in general which often draw on a smaller number of cases (Gordon and Langmaid, 1998; Patton, 2002) and focused on meanings in a given context, rather than on ensuring numerical representativity (Almeida et al., 2017). Furthermore, previous research highlights that determining an a priori sample size in qualitative research can be problematic (Patton, 2002). This is because sampling—particularly for grounded theory studies—is often adaptive and emergent (Becker, 1993). Contrary to the quantitative approach, the qualitative sampling process is often subjective (Fusch and Ness, 2015); as Patton (2002) highlights, there are no concrete rules guiding sample sizes in qualitative research. Given the objectives and parameters of our study—and that new data did not contribute to additional insights into the core categories (Charmaz, 2006) −22 interviews were sufficient in addressing the measures of validity and rigor in qualitative research (Creswell, 2009).

The recruitment for our sample used two approaches. First, we advertised the study on career websites at The University of New South Wales and The University of Technology Sydney. Then, in order to ensure that our sample also included a good number of participants with conservative political views, who past research has shown to have positive attitudes toward meat consumption (Ruby and Heine, 2012; Hayley et al., 2015), we used Facebook to

advertise our study to users who "liked" things such as barbecues, hunting, and conservative political parties and media channels.

Procedure

We conducted a pilot study of seven interviews in order to practice face-to-face interactions prior to the start of the fieldwork, and to provide initial insight into our topic (Schreiber, 2008). The sample was obtained through placing advertisements on university career websites and on social media. As there were no significant methodological changes between the pilot and main study, we combined the two data sources. All interviews were conducted at a mix of outdoor venues such as university campuses, cafes, and restaurants. All participants were provided light refreshments and a chance to participate in a lucky draw where one winner was awarded AUD $200.

Data Analysis

The research used an iterative study design, which entailed cycles of simultaneous data collection, analysis, and adaptations to some questions to refine the emerging theory. Thus, as data collection progressed, unexpected topics raised by a participant could be explored further with subsequent participants (Charmaz, 1996). Individual cases or experiences were then progressively developed into more abstract conceptual categories to synthesize the data and identify patterned relationships within it (Charmaz and Bryant, 2008).

The process of qualitative data analysis can be described as bringing order, structure, and meaning to data (Creswell, 2009). Qualitative research studies increasingly employ electronic modes of data coding to assist with structure, meaning, and rigor as part of the analysis (Bazeley, 2007; Leech and Onwuegbuzie, 2011). Bazeley (2007) discusses key tasks that NVivo can help with when managing and analyzing large amounts of qualitative data. These include storing data such as interview transcripts, and notes from observations; coding emerging themes and identifying links between them; and visual modeling to help with visually identifying relationships between codes and themes (Bazeley, 2007). Within our study, several themes relating to meat-eating practices emerged. Some of these included differences in past and present meat-eating practices, the influence of various information sources, the relationship between meat and gender and participant views toward animals. Our study used NVivo to sort and code different categories and corresponding sections of text, thus making it easier to work with and process large amounts of data.

Ethics

Prior to commencement, this study was approved by the Human Research Ethics Committee at the University of Technology Sydney (ETH18-2328). During recruitment, each participant was informed of the purpose of this study and the recruitment proceeded only once the participant was satisfied with the requirements of the study and provided written consent. All participant information was treated in a confidential manner.

RESULTS

We begin this section by briefly discussing past meat-eating practices, followed by why and how these practices are changing within contemporary urban Australia. Finally, we conclude this section by highlighting why many Australians remain reluctant to adopt more plant-based foods into their diet despite feeling pressure to do so.

Past Meat-Eating Practices

Symons (1984) states that the traditional colonial Australian meal typically comprised red meat, such as beef and lamb, as the main material element. In comparison, there was a limited amount of plant-based foods (Lupton, 2000; Sheridan, 2000). These practices were also reflected among our study's participants as many recalled that meat was a staple when growing up, with meat-heavy meals eaten on a regular basis.

- Meat was staple in the diet. Wouldn't surprise me if we had meat for every meal, it wouldn't surprise me at all (Man, 40–45 years).
- We'd usually have what I guess some would say a standard Australian meal … either steak or schnitzels or sausages … we ate a lot of meat with vegetables as well (Man, 30–39 years).

Many also discussed the sensory pleasure derived from meat-based material elements. In this regard, eating practices of the past, which can include sensory enjoyment derived from meat-eating, can leave "imprints" upon participants who continue to carry and embody these practices (Daly, 2020, p. 245). Fiddes (2004, p. 92) further elaborates upon this sensory enjoyment associated with meat eating in that pleasure arises from meat having a "bite to it: something to get one's teeth into, that puts up a bit of resistance." These sentiments were also noted in our study:

- It [meat] tastes to me like the bass in song sounds … It sort of sits underneath it and it gives it a little bit of after taste. Like the texture itself. It … holds together relatively well. It separates a little bit easier than say the bread, but it's not mushy, it has a little bit of resistance to it, which is nice (Man, 30–39 years).

Materials can also serve as symbols of meaning (Warde, 2005) and meat continues to be associated with nutrition and health in Australia (Bogueva et al., 2017). Participants commonly used the term "protein" to refer to meat. In contrast, the association between protein and plant-based foods was less common. In this regard, meat was more synonymous with meanings of "real food" (Robert-Lamblin, 2004, p. 92) and thus a balanced diet.

- Protein … Chicken, fish, red meat, any one of those three. My mother always made sure that our meals were balanced (Woman, 40–45 years).
- It would always include a meat … roast pork or a roast … We'd be having a protein, I'd say 6 out of 7 days over a week (Woman, 40–45 years).

As highlighted in previous work (Lupton, 2000; Sheridan, 2000) and as also noted in this study, vegetables were often presented as side dishes within the main meal. As material elements

have meaning in relation to the practices that they are part of (Shove and Pantzar, 2005), vegetarian elements were largely relegated to the category of "less important" within traditional Australian eating practices. Furthermore, eating one's vegetables was considered to be a chore. Other work has similarly revealed how "eating one's greens" is not deemed inherently pleasurable (Hesketh et al., 2005; Holden, 2007).

- We had vegetables … I didn't really like them that much. I just ate them because they were there and we had to eat them. I guess if I could have, I just would have eaten meat … we were told they [vegetables] were healthy, so we should eat them (Man, 40–45 years).
- I'd love to come home to steak. My mum would cook it … Occasionally she'd do the filet beef as well … my dad was very big on eating broccoli and cauliflower … I didn't enjoy them (Man, 30–39 years).

Plant-based eating was also viewed as "unnatural" by some participants in our study. Previous work has similarly highlighted that people tend to consider to meat as normal, necessary, natural, and nice across multiple sociocultural repertoires (Piazza et al., 2015; Oleschuk et al., 2019). In addition to Australians considering meat as a "necessary" dietary requirement (Bogueva and Phau, 2016), plant-based eating also tends to be viewed as a form of deviance from Western mainstream eating practices (Kellman, 2000; Monin, 2007; Potts and Parry, 2010):

- My family in the country … I've heard them say they view it as unnatural, vegans. The whole "we're meant to eat meat because we're omnivores." They say it's just the cycle of life. Things die. It doesn't really matter who kills the animal or for what purpose (Man, 23–29 years).

Meat, as a material element, has featured heavily within the traditional Australian diet and is associated with meanings of health, a balanced diet, necessity, and sensory pleasure. In this regard, many seemed to subscribe to the notion that "our meat eating is something very deep indeed" (Pollan, 2002, para. 65). However, these meanings are also changing which, in turn, is creating a shift in eating practices. This is elaborated upon in subsequent sections of this paper.

Exposure to Alternative Eating Practices

A practice does not only comprise individual attitudes and beliefs, but also resources, conventions, systems, and infrastructures (Spurling et al., 2013). This section elaborates upon how changing conventions and socio-economic structures have encouraged a shift in traditional meat-eating practices. One influencing factor was the change to Australia's *Immigration Restriction Act* which, between 1901 and 1958, only permitted the migration of people from European backgrounds into the country (Hugo, 2006). This change in immigration policy saw an increase in cultural diversity when more people, in particular those from South and South-East Asia, arrived in the country (Crook, 2006). These people played an important role in increasing vegetarian practices within Australian society (Wahlqvist, 2002; Crook, 2006). The onset of globalization, later in the early 1990s, further encouraged exposure to an array of new cultural practices (Pickering, 2001). To this point, Maller and Strengers (2013) discuss the dynamics of practice diffusion that can occur through large-scale movements of individuals as well as through the spread of cultures. The authors also state the practices are not merely "transplanted into another country or context" but change and adapt to the local context (Maller and Strengers, 2013, p. 243). In this regard, practices carry with them the "seeds of constant change" (Warde, 2005, p. 140). Thus, new configurations of eating—through integration and transferal—have helped redefine meat-eating in Australia today (Daly, 2020). In addition, the rise of dual income households and disposable incomes (Hugo, 2006) has also encouraged eating outside the home (Finkelstein, 2003). All of this helped bring about a shift from traditional meat-eating practices:

- I would have dinner at friend's places where they would be from a vegetarian backgrounds or religions, and I found it quite fascinating, like, "Wow, this is so different. There's no meat on the table." Kind of weird, but then it grew on me … I started to think this was creative, and different, and interesting. You can make a whole balanced meal, still feel full, and live a healthy lifestyle without meat involved (Man, 23–29 years).
- In Australia, with a lot of multiculturalism, you get different cuisines everywhere … I had the opportunity to try Vietnamese, Mexican and all of the different types of foods and their cooking methods are different as well (Woman, 30–39 years).

Changing Gender Narratives

Changing discourses of masculinity have also brought about a shift in meat-eating practices. In many Western societies, meat eating was traditionally linked with symbolisms of masculinity and power (Rozin et al., 2012; Rothgerber, 2013) while vegetarianism was associated with femininity and weakness (Fiddes, 2004; Adams, 2010). However, Australian society is witnessing a change from "restrictive gender roles" (O'Neil, 1990, p. 25) toward embracing more fluid representations of gender (The University of Melbourne, 2016). This, in turn, appears to have influenced meanings in relation to meat eating as many participants considered stereotype of the meat-eating man as somewhat redundant today:

- If you could eat this giant, big steak, it bestows some kind of prowess on you? I don't know, people are supposed to be impressed by that? … it's pretty dumb. I don't subscribe to it myself, it seems low-brow to me. If someone in my circle said that … I'd feel like I don't like this person (Man, 30–39 years).
- I don't think people care if I'm eating vegetarian food. Some people just ask why do you do it? Or good on you … I don't think I would get shunned or socially ostracized because I didn't eat meat … I think it's stupid … If men want to eat vegetables, they can (Woman, 40–45 years).

As a part of these changing narratives, the practice of eating meat-heavy meals was also associated with negative meanings:

- Well, my dad was a complete, stereotypical Australian bogan [slang for an uncouth person]. So there would be a lamb roast on the dinner every day … he's very likely to have meat at least once a day, if not always at dinner (Man, 23–29 years).

The Rise of Environmentalism

Another force that encouraged change was the growth of environmentalism across many Western societies, particularly in the twentieth century (Grunert et al., 2014). Factors contributing to this include increasing media focus on environmental issues (Roberts, 1996), the rise of non-government organizations (NGOs) and lobbyists (Strong, 1996), and a shift in market power toward the consumer (Harrison et al., 2005). This, in turn, spurred the rise of the ethical consumer (Newholm and Shaw, 2007) as people became more conscious of the socio-environmental impacts of consumption and production practices (Devinney et al., 2010). In Australia, the media has played a key role in shaping public opinion toward the livestock industry (Sinclair et al., 2018) and meat-eating (Animals Australia, 2015). In this regard, the media can be considered an important material resource through which new knowledge is disseminated (Phillips, 1997) and practices are subsequently shaped:

- From reading or watching TV. I mean, basically, the cost of producing a cow is a lot higher to the environment than producing a similar quantity of, say, vegetables, so it's better for the world if everyone just ate veggies rather than cows (Man, 40–45 years).

Global campaigns such as "Meat-free Mondays" and "Veganuary" that call for the reduction of one's meat intake (Mceachern, 2018) have also helped encourage dietary practices like reducetarianism (Kateman, 2017) as noted below:

- When the Titanic sank you don't say "oh I don't have room for everyone, throw everyone overboard, out of lifeboats," you do what you can. I guess that's the philosophy of reducetarianism, eating one bit of chicken a month is better than a person who eats it twice a day. I think it's arguably less harmful (Man, 40–45 years).

As part of this discussion, some mentioned that they would like to further cut back on their meat consumption and increase their intake of plant-based foods:

- There's an environmental impact to the way meat's prepared and while I don't think that I would want to be full vegetarian, I can at least make choices which minimize those impacts (Man, 30–39 years).

Others reported purchasing local meat as they considered it more environmentally friendly. This reinforces previous findings that locavorism—which involves supporting locally grown foods in order to reduce food miles—is viewed as an environmentally sustainable practice (Pollan, 2007; Rudy, 2012):

- I love kangaroo and it's also lean healthy meat … it's a sustainable meat source, it's good for the environment … yeah you have to kill the kangaroo unfortunately but you know it's actually quite an efficient part of the ecosystem (Man, 30–39 years).
- I like the idea of using native ingredients … I just wish there was an indigenous section in the supermarket or in the local deli … included as just a part of everyday Australian eating … they would include kangaroo … worm, any native worm, any native grub, they would include crocodile, dugong and things like that (Woman, 40–45 years).

The image below, taken at a supermarket, depicts how kangaroo steak has been labeled as "sustainable." In addition, the use of terms such as "iron" and "protein" further convey meanings of health and nutrition. Kangaroo steak, as shown in **Figure 1** (Kozlenko, 2015), is linked with meanings of environmental sustainability and health.

Rising Health Consciousness

In addition to environmental concerns, rising levels of health consciousness (Caldwell, 2019) and awareness of the health-related impacts of a meat-heavy diet (Lea et al., 2006; Food Frontiers and Life Health Foods, 2019) brought about, in part, by the media, are also influencing eating practices. This reflects similar findings from a body of previous work (Ruby and Heine, 2012; Forestell, 2018; Graça et al., 2019; Reipurth et al., 2019). A recent study among meat-eaters in the United Kingdom has further indicated that, when it comes to meat reduction, environmental concerns can be relatively less influential when compared to factors like individual health and well-being which can be very strong motivators (Mylan, 2018). This was also noted in our study:

- I try now to eat less protein [reference to red meat]…for health reasons, and I guess, in some ways, I guess, it's better for the environment…The most important reason is health reasons. Secondary would be the environment… like meat, red meat…It causes inflammation in the body. It's bad for the body, and also it sets off certain triggers in the body that aren't good for the body…It's really for health reasons (Man, 40–45 years).
- I listen to a lot of radio in the day … they had someone from Diabetes Australia … they were talking about the risk with eating meat … I think it was bowel cancer … the more meat you eat, there's a higher risk (Man, 30–39 years).

Some also mentioned advice from their healthcare practitioners had helped them change their eating practices. In this regard, the healthcare practitioner, like the media, can also be considered a material information resource. To this point, Sijtsema et al. (2021, p. 17) also highlight the influence of "significant others," such as doctors, when it comes to shaping dietary choices:

- My father, for instance, whenever he goes to the doctor, they always say, "Oh, yeah, you should change your diet. Introduce more vegetables. Cut back on meat. You know, have a fresher diet" (Man, 23–29 years).

Others in our study discussed replacing red meat with fish and chicken, predominantly for health-related reasons. This change has also been reflected in other work on Australian consumption patterns (Wong et al., 2015; Taylor and Butt, 2017).

- I think chicken and fish are pretty healthy for you. I think [eating] red meat very occasionally is fine (Man, 23–29 years).

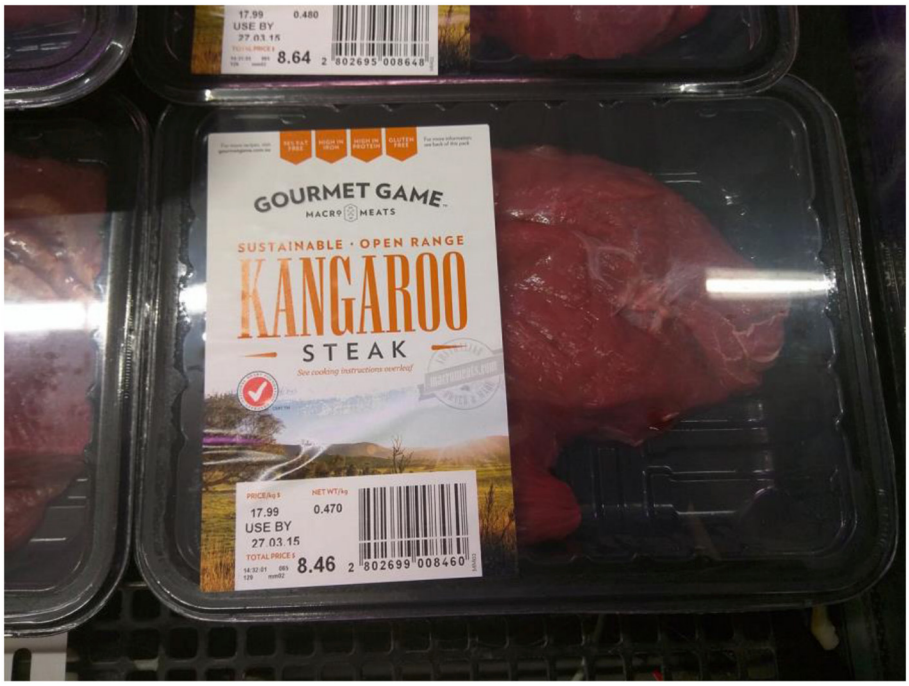

FIGURE 1 | Meat-eating practices in Australia: Kangaroo steak is promoted as sustainable meat.

Awareness of Animal Welfare Issues

Previous work has indicated that increasing access to material information on unsustainable farming practices (Grandin, 2014) has encouraged consumers to pay more attention to "animal 'happiness'" when buying animal-based foods (Bray and Ankeny, 2017, p. 222). This was also noted in this study:

- I buy free range eggs, I don't buy the caged battery hen eggs, because I don't like the cruelty to the animals there … seeing advertisements or infomercials on TV or whatever, in regards to the caged hens … it's like being in a prison. You don't want to be in a prison, you ought to be free (Man, 40–45 years).

This change toward supporting more humane animal-based foods appears, in part, to be facilitated by access to material devices like smartphones and mobile apps. Among the many mobile apps available today, some are specifically designed to encourage sustainable consumption (Fuentes and Sörum, 2019). Thus, a mobile app can be mobilized and manipulated as part of a practice (Shove, 2017) and can help shape a practice in one or more of the following ways: automation (i.e., replacing human labor with digital search functions which creates new competencies), information (i.e., provision of new material knowledge), and transformation (i.e., changing practices as a result of new materials, meanings and competences; Chen et al., 2008). This was also evident in the present study:

- I only ever buy free range eggs and I have an app on my phone which will tells me what the actual density of the farm is … It's something that Choice [a non-profit consumer advocacy organization] made called Cluck AR (Man, 30–39 years).
- I would always buy the one that gets the RSPCA app…the 10 Stars rating (Woman, 40-45 years).

As part of the move toward kinder meat eating, some participants said they substituted certain meats for others like chicken and fish. Meanings associated with these elements played a key role here, in that participants reported feeling less morally conflicted about consuming chicken and fish, which they deemed relatively less sentient. To this point, a recent study has revealed that some semi-vegetarians and omnivores even to tend to view eating fish as part of vegetarian dietary practices (Mullee et al., 2017). Other literature highlights that perceptions of an animal's intelligence can be a strong predictor of the levels of dissonance associated with consuming certain animals (Loughnan et al., 2014). In this regard, carnism—which involves categorizing certain animals as more acceptable to eat than others (Joy, 2010)—appeared to underpin some of these meat substitution practices:

- I think fish is the healthiest (type of meat) but some people don't classify fish as meat…Some of my friends have said that meat means pork or beef or something else. They refer to land animals as meat (Woman 23–29 years).
- I think that fish just aren't as smart [laughs] with the exception of the octopus. So prawns, oysters and fish, I don't think they have the same ability to feel as say a pig does (Woman, 40–45 years).

Changes to traditional Australian meat-eating practices have mainly included cutting back on meat intake and replacing certain meat-based elements with other meat-based elements

deemed kinder, healthier, and more environmentally friendly. Although some discussed wanting to further cut back on meat consumption and increase their intake of plant-based foods, this practice was relatively less common. This reflects other findings in that, in some Western contexts, meat reduction practices often revolve around limiting meat consumption for one or more days in a week rather than making vegetarianism the goal (Dagevos, 2016). The subsequent sections of this paper delve into why the adoption of plant-based foods was a barrier for many Australians.

Barriers Relating to the Adoption of Plant-Based Foods as Part of Changing Australian Eating Practices

Previous literature has highlighted that strict vegetarianism in Australia is sometimes viewed as an extreme (Lea and Worsley, 2003). To some degree, this was also noted in the present study, as material accessibility, meanings, and competences in relation to plant-based foods made vegetarianism a challenge for many.

The Practicality of Plant-Based Eating

Many participants highlighted that they had limited access to material elements such as plant-based menus and recipes. Indeed, practice theorists consider materials as important elements constituting a practice (Shove and Pantzar, 2007), referring to them as "necessary, irreplaceable components" (Reckwitz, 2002b, p. 210). To this point, previous work points to how material and sociocultural environments tend to encourage meat-eating and, in turn, discourage alternative eating practices (Dagevos and Voordouw, 2013; Dagevos, 2016, 2021). This is because within the "home and out of home.…(and) Regardless of whether we dine in a fast-food restaurant or a high-end restaurant, meat tends to dominate the menu." (Dagevos, 2021, p. 532). These views were also noted in our study:

- I have found that in regards to vegans … it's very hard for them to get food. Because, if I go out to normal places, there wouldn't be foods that are suitable for them … your choices are so limited (Male, 40–45 years).
- If you go to Woolworths and get those recipe books … you only have one or two vegetarian meals vs. 10 meat meals so I think they need to provide more options for a vegetarian diet (Woman, 30–39 years).

To this point, the widespread availability of meat is captured in **Figure 2** from supermarket chain Woolworths' *Fresh Ideas* magazine. It also highlights how the encouragement of new cooking competences still revolves around meat-based elements.

The recipe index in *Fresh Ideas* magazine's May 2020 edition shows how meat-based materials still dominate Australian meals (Woolworths, 2020). As shown in **Figure 2**, there are only seven recipes in the meatless sections compared to twenty recipes in the meat, poultry, and seafood sections.

In addition, another aspect of material accessibility relates to the expense of plant-based foods relative to meat. Many participants mentioned that plant-based foods were comparatively more costly and therefore more challenging to access. This issue of accessibility shares parallels with the work from Sijtsema et al. (2021), who highlight how opportunities and barriers that arise from social and physical contexts—such as having a viable array of meat alternatives in the supermarkets—can help foster or hinder certain eating practices.

- I've seen all the vegetarian stuff you can get in the supermarkets now … it's expensive unless it's on mark down on a sale or on special (Man, 30–39 years).
- I got some vegan sausages a while ago, and they were actually really, really nice, but yeah, the other thing is cost. They're more expensive. Whilst I did like the taste … I couldn't afford to get those as often as I could get real sausages or real meat (Man, 23–29 years).

Other participants mentioned that plant-based foods were not as filling as meat-based foods. This reflects other findings in that meat, as a material element, is synonymous with feelings of fullness in many Western contexts (Lupton, 1996). Thus, abstaining from meat can be associated with negative feelings of weakness and grief, which can arise from the affective connections one may have with meat (Graça et al., 2015).

- When I just have vegetarian meals for a couple of days, I feel that I don't have enough energy. You're full but you're not content … but if you have a piece of steak, you feel full for a longer time. But if you only have vegetables even though you have a lot, like you could have spinach, carrots, cauliflowers … I feel like it's just gone quickly (Woman, 30–39 years).

This lack of fulfillment associated with plant-based foods was also linked with perceptions of such foods being nutritionally inadequate. Other work has similarly highlighted that meat reducers may be concerned about shifting to a plant-based diet, in part, due to perceptions about their nutritional inadequacy (Malek et al., 2019; Sijtsema et al., 2021). In addition, plant-based eaters also tend to be viewed as physically weaker (Allen et al., 2000; Mycek, 2018). For these reasons, those who intend to reduce their meat consumption might be likely to still continue consuming some amounts of meat until perceptions of the nutritional adequacy of meat-free diets start to become more positive (Malek and Umberger, 2021).

- With meat, you're sort of giving yourself a complete diet … when you see a lot of these vegans, they don't look well, you know? I mean, their hair will be thinning, they'll look a tad underweight, their skin will be kind of pale (Man, 23–29 years).

Competence, also known as "practical knowledge" or "embodied skill," encompasses the non-conscious skills that individuals employ to carry out practices (Shove and Pantzar, 2005). This was another barrier to the adoption of plant-based eating, in that several participants claimed that they simply did not know how to cook hearty and nutritionally balanced plant-based meals. This parallels the concept of "capability," within the COM-B model of behavior, which refers to one's psychological and physical ability to carry out certain behaviors (Graça et al., 2019). Sijtsema et al.

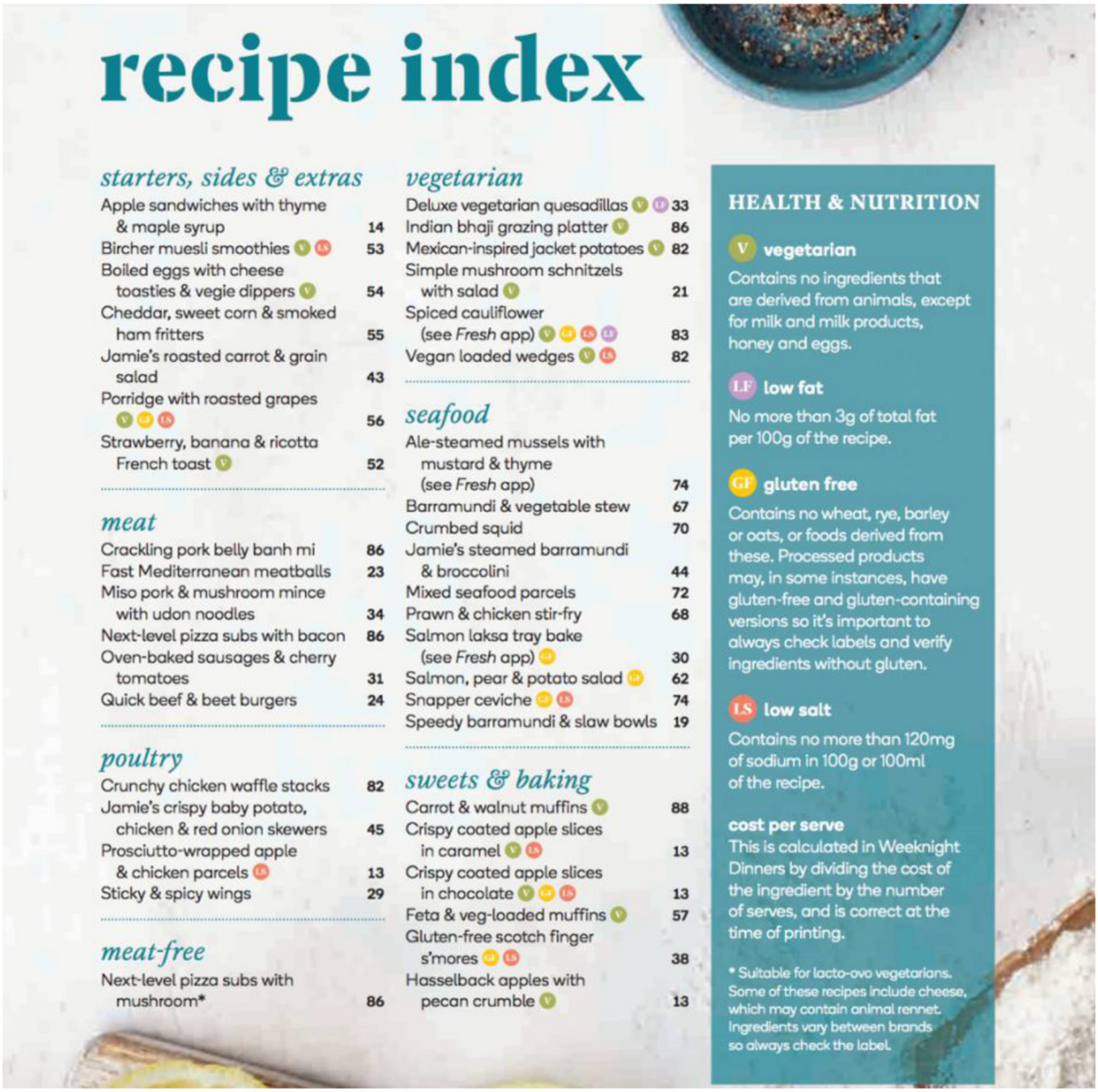

FIGURE 2 | Meat-eating practices in Australia: Fresh Ideas magazine's meat-heavy recipe index.

(2021) highlight how capability can hinder certain behaviors if people feel they lack adequate health-related and nutritional knowledge in relation to plant-based eating. In other instances, people may also be discouraged from plant-based eating if they do not feel comfortable with preparing a meatless dish when they have guests over for a meal (Sijtsema et al., 2021). In this regard, meanings, norms, and perceptions of social acceptability can play an important role when influencing eating practices (Bastian, 2019). This was noted in our study too:

- I just don't have really great vegetarian recipes—I really struggle when my vegetarian friends come over (Woman, 40–45 years).
- I guess they're bland unless you do something with them, that's the problem—and adding lots of fancy sauces to vegetables then doesn't make it good for you … The other thing is that a lot of people don't know how to prepare vegetables. They boil the hell out of them … that makes them pretty average as well (Man, 40–45 years).

Associations Between Meat and Masculinity

While on one hand, the narratives around meat eating and gender are changing in Australian society, traditional views of meat's association with masculinity and virility (Potts and Parry, 2010; Ruby and Heine, 2011) were still noted by some participants. This, in turn, created negative meanings toward plant-based eating:

- I can tell you if I had a vegetarian or a vegan male friend in my group, they would definitely be mocked … They'd just call him a pussy … I guess the mindset that meat's for strong manly blokes and it's giving you all your iron and you need meat to survive (Man, 30–39 years).
- I will look twice, yeah. "What's that, rabbit food" (Man, 40–45 years)?

Previous work has highlighted that negative images portrayed in the media toward plant-based eating have also contributed to public perceptions toward these practices (D'Silva, 2013; Mastermann-Smith et al., 2014). Meat advertisers continue to reinforce gender stereotypes (Rogers, 2008; Adams, 2015) while also (not so) subtly mocking plant-based consumers who don't conform to these stereotypes (Bennett, 2018). An example of such a campaign is pictured in **Figure 3**. Sam Kekovich, featured here, is a former player for the Australian Football League and spokesperson for a long-standing meat-based campaign (Dawson, 2019). He is often portrayed as reflecting the tough-talking, meat-eating male stereotype (Cheik-Hussein, 2019). To this point, Dagevos (2021, p. 532) also points to how meat culture is encouraged "by massive advertising and promotion," all of which further promotes the sociocultural significance of meat consumption.

Views Toward Plant-Based Meats

Plant-based meat alternatives (PBMAs) are also referred to as meat substitutes or fake/mock meats (Ismail et al., 2020) and are designed to resemble the texture, flavor, and appearance of meat (Joshi and Kumar, 2015). Recent studies highlight that there has been a five-fold increase in the number of PBMAs on Australian supermarket shelves since 2015 (Curtain and Grafenauer, 2019). This appears to correspond with the rise of vegetarianism and flexitarianism in Australia (Roy Morgan Research, 2019). A study on Australian food consumption by Estell et al. (2021) indicated that when it comes to PBMAs, beef and chicken alternatives tend to be most popular. The work also highlights that seafood alternatives are not as popular due to much of Australia's flexitarian population still choosing to include fish/seafood in their diets (Estell et al., 2021). Observations in our study similarly reflect predominantly plant-based beef and chicken alternatives, as material elements, within Australian supermarkets. This is shown in **Figure 4**. By assuming the appearance of meat-based foods, including the use of terms such as "mince" and "snags," these elements may shift meanings of health and sensory enjoyment—traditionally linked with meat—to also include plant-based foods.

Despite the rise of PBMAs in Australian supermarkets, previous studies have found that the sensory properties of such foods are a key barrier to their adoption (Sadler, 2004; Kumar et al., 2017). Similarly, the participants in our study largely found the sensory properties of such foods to be unappealing.

- I've had the fake meat burgers and every time I've tried them, there's just been something off about the taste … Lord of the Fries sells "Chick'n" … it's technically not chicken … it looks like a chicken drumstick, and you bite into it, and it tastes like compressed onion … It's a really disconcerting feeling when you're biting into it, cause you're going, "Oh my god it's worms!" (Man, 30–39 years).
- I think the texture is still not there, the flavor still not there and I think they are replicating another product which I think is crazy. They're just creating a new product, they're basically saying here is fake chicken (Man, 40–45 years).

For some participants, there were also concerns about the levels of processing in PBMAs. Other work has similarly indicated consumer concerns with processing and the nutritional adequacy of PBMAs (Hoek et al., 2013; Arora et al., 2020; Sijtsema et al., 2021) as such foods can also be deemed unnatural (Hwang et al., 2020).

- I had this friend, she was a big girl—she would eat a lot of pasta and cheese. It was so stupid because it's all manufactured food really, it's not natural. And also, I see them [reference to plant-based consumers] eating the fake vegetarian foods, the fake meat—it's so highly processed…I think those are really bad for you (Woman, aged 40–45 years).

A product can also be reflective of a consumer's self-image (Devinney et al., 2010), as consumers often focus upon meanings beyond just the functional purpose of a material commodity (Shove et al., 2012). Previous research has indicated that counterfeit goods can be synonymous with meanings of deception (Hoe et al., 2003), and some participants reported similar such associations with PBMAs:

- I just don't like the idea … if I want to eat a steak I will eat a steak, if I want to eat a vegetable I will eat a vegetable … I don't like people who pretend and I don't like manufactured music either … I don't like fake products, made like on the cheap, out of China and stuff like that … my motto in life is have fewer things but have quality things and don't try and have a lot of rubbish (Man, 30–39 years).

The challenges in relation to adopting more plant-based foods arose due to several reasons: limited material availability of plant-based menus and recipes, limited sensory appeal of plant-based meats, limited competences in relation to cooking nutritionally balanced meals, and negative meanings associated with plant-based practices. Each of these elements—materials, meanings, and competences—were interlinked and had equal weighting within performance of the practice, thus shaping one another and the practice of which they were a part (Shove et al., 2012).

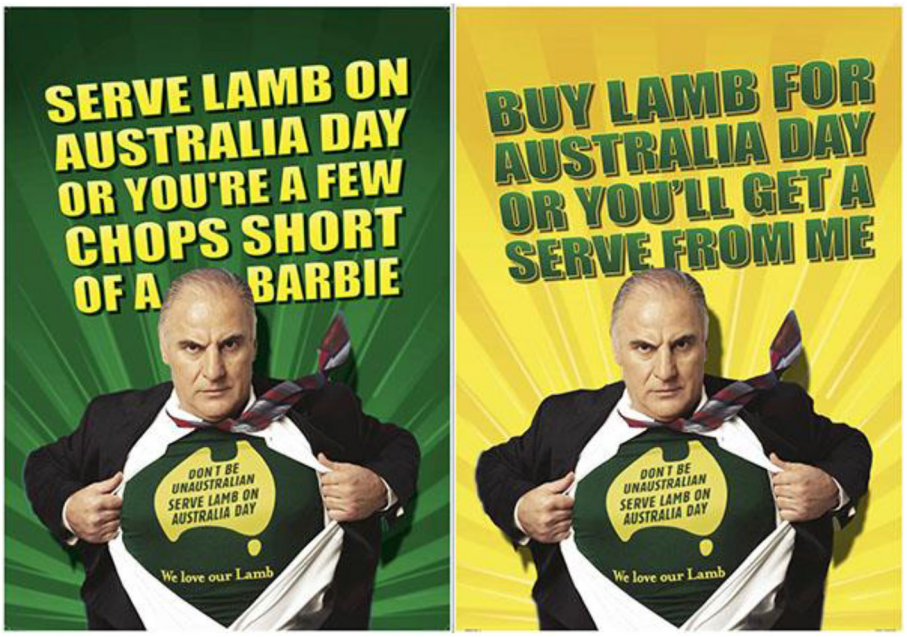

FIGURE 3 | Meat-eating practices in Australia: Meat & Livestock Australia's popular lamb campaign.

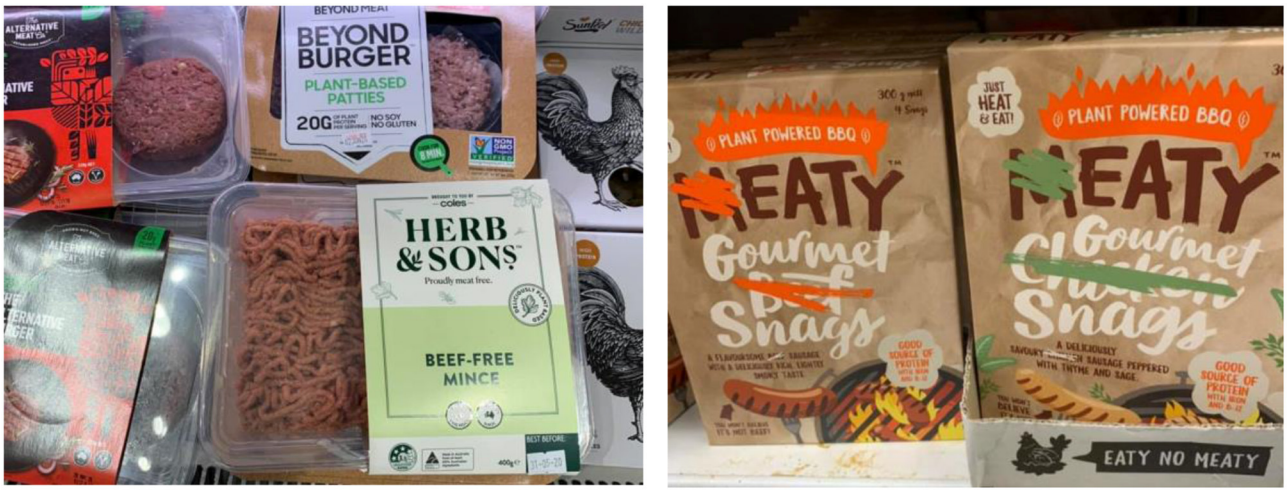

FIGURE 4 | Meat-eating practices in Australia: A variety of plant-based meats in Australian supermarkets.

DISCUSSION

Although OECD figures indicate that Australian meat-eating levels are among the highest globally (OECD, 2019b), Australian meat-eating practices—shaped by a broader array of shifting conventions, systems and social infrastructures (Spurling et al., 2013)—are also changing. To this point, Daly (2020) claims that Australian meat-eating practices are in flux. Changing tastes and the manner in which Australians are engaged in "acts of consuming, sensing, choosing, or deciding" signifies an evolution in eating practices (Daly, 2020, p. 242).

Furthermore, a practice may change over time with larger societal changes as each practice is shaped by a broader realm of infrastructures, technologies, and society (Giddens, 1984). In relation to Australian meat-eating practices, changes in political policy (Wahlqvist, 2002) and the advent of globalization (Pickering, 2001) have been fundamental in encouraging exposure to new eating practices. In addition, the departure away from rigid gender-based norms (James, 2010) appears to have further contributed to dietary change. Over subsequent decades, there have also been rising levels of environmental (Grunert et al., 2014), health (Caldwell, 2019) and animal welfare

concerns (Szmigin et al., 2009). Furthermore, the media—as the material conduit of information on meat eating (Munro, 2015) and farming practices (Sinclair et al., 2018)—has also played a significant role. This has been further enabled by access to new technological materials (Fuentes and Sörum, 2019) that have encouraged new competences, and hence, new eating practices.

Although participants in our study had reduced their previously high levels of red meat consumption, they largely turned to other types of meats that they considered healthier and more ethical, rather than reducing their total meat consumption. Thus, more broadly, it seems that meat-based materials still continue to maintain a significant presence within the Australian diet. While many expressed interest in wanting to adopt more plant-based foods, they identified several challenges that made further evolution of their eating practices difficult. These included difficulties in accessing certain plant-based material elements, perceived lack of competence in preparing palatable plant-based meals, and negative meanings associated with the nutritional adequacy of plant-based foods. While every element had more or less equal weighting, connections between certain elements emerged as more frequent depending on the context (Schatzki, 2012).

In addition, there was the unappealing sensory experience associated with plant-based meats. While meat eating incorporates various material elements, meanings, and competences, previous work highlights that the sensory enjoyment of meat is also dependent on the context and experience associated with it (Gibson, 2006). This is because "perceptual sensitivity is learnt and…Each sense is not only physically grounded but also its use is culturally defined" (Rodaway, 1994, p. 22). Furthermore, conventions and philosophies such as carnism (Joy, 2010) as well as traditional notions of masculinity (Adams, 2015), both of which encourage the consumption of animals, were also noted in our study. In this regard, meaning associated with meat and meat-eating—i.e., the collectively agreed-upon norms and conventions that underpin practices (Strengers, 2010)—were also key barriers to the greater adoption of plant-based foods.

Limitations

One of the key limitations of qualitative studies, in general, is that the findings may not be representative of the attitudes and behaviors of the broader population of interest (D'Alessandro et al., 2017). However, as highlighted previously, the aim of this study was not to provide numerical representativity but to understand meaning making (Charmaz, 2000). This required going beyond the explicitly stated data and focusing on tacit meanings about values, beliefs, and ideologies (Charmaz, 1996, 2006; Charmaz and Bryant, 2008) as part of exploring meat eating practices in Australia.

Future studies on meat eating practices may need to explore differences across various Australian subgroups. For one, researchers may wish to delve into differences across men and women given the latter are more likely to be semi-vegetarians (Worsley and Lea, 2008; Derbyshire, 2017). Furthermore, younger Australians are more likely to demonstrate greater concern about the environmental impacts of meat eating (Lea and Worsley, 2002, 2003) and people with higher levels of education have also been found to be more receptive to alternative dietary practices (Lea et al., 2006). Differences across urban and rural Australia may also need to be considered, given previous findings that urban Australians report feeling more conflicted about meat consumption (Bray et al., 2016). In addition, factors such as family influences and differences in lifestyles (Lea and Worsley, 2001, 2003) may also need to be explored further.

The primary researcher of this study follows a plant-based diet for ethical reasons. Although this was not disclosed to the participants, it raises the possibility of subconscious bias on part of the researcher (Probst, 2015) that may have colored interpretations of participant accounts of their eating practices. However, Charmaz (2000) highlights that researcher subjectivity is an inevitable part of constructivist grounded theory. Therefore, one should not attempt to remove researcher subjectivity from the resulting theory, but rather, should aim to prioritize the data over any prior knowledge or views in relation to the topic (Charmaz, 2000). In this study, this was done through gathering perspectives from multiple researchers as part of the analysis (Gordon and Langmaid, 1998), some of whom have different dietary practices. In addition, triangulation—through the use of secondary data sources—helped with obtaining diverse viewpoints (Olsen, 2004) and with validating and corroborating the data gathered for this study (Ramalho et al., 2015).

Potential Applications

The findings from our study as well as recent previous studies (Malek et al., 2019; Daly, 2020; Estell et al., 2021) indicate a shift in Australian meat-eating practices. However, Australia is still referred to as the "meat-eating capital of the world" (Ting, 2015; Fruno, 2017). To this point, a recent survey on urban Australian consumption patterns found that only 10% of Sydney residents opted for predominantly plant-based diets (Marinova and Bogueva, 2019). This is despite the fact that 81% of the survey participants claimed to be aware of the negative global impacts of the meat and livestock industry (Marinova and Bogueva, 2019).

Given the growing number of researchers calling for a global shift to a heavily plant-based diet for health and sustainability reasons (e.g., Hertwich et al., 2010; Willett et al., 2019), current attempts at meat reduction, in what is still a predominantly meat-based culture, can be described as "inadequate" at best (Dagevos, 2016, p. 239). It seems that a key challenge for policy makers has been the ability to balance both nutritional and environmental goals when it comes to making dietary recommendations (Goulding et al., 2020). For one, the recent Australian Dietary Guidelines have been criticized for prioritizing nutritional goals over environmental sustainability (Parker and Johnson, 2018) as scholars argue more needs to be done to highlight and incorporate the interconnection between food and sustainability in their dietary recommendations (Selvey and Carey, 2013).

A recent report from the EAT–Lancet Commission was the world's first to propose guidelines that integrate individual nutritional needs with environmental sustainability, forming a single set of global dietary recommendations that can be

customized for regional cultural preferences (Willett et al., 2019). A recent Australian study, which aimed to develop a healthy and sustainable food basket modeled on these recommendations, measured the affordability of such a diet across various urban socio-economic groups nationwide and compared this with the typical current Australian diet (Goulding et al., 2020). The findings encouragingly found that such a diet is potentially affordable and financially feasible for metropolitan-dwelling Australian households, regardless of their socio-economic status or location (Goulding et al., 2020). However, the authors of this study also highlight that more needs to be done in terms of food promotion, nutrition literacy, and cooking skills to help Australians transition toward a more healthy and environmentally sustainable diet (Goulding et al., 2020). This reflects the concept of "capability building" referred to by Sijtsema et al. (2021), who state that encouraging plant-based lifestyles would require people to become more comfortable in their knowledge and skills in relation to plant-based cooking and eating. This would also encompass information campaigns about the adverse health-related impact of meat overconsumption (Sijtsema et al., 2021). This was noted in our study as well, in that our participants discussed needing some guidance on choosing and preparing plant-based meals that are both nutritionally balanced and appetizing.

To help encourage further shifts, another tactic might involve stronger promotion of strategies that have already been shown to support meat reduction and plant-based consumption. To this point, a participant in our study, as part of the general discussion on reducetarianism, pointed to the effectiveness of the "I Quit Sugar" programme and suggested something like this was also needed to help people further cut back on their meat intake. Thus, there is the need to create opportunities or "enabling social environments" to make easier for people to carry out certain behaviors (Sijtsema et al., 2021). Some examples include the Meatless Monday and Meat Free Week campaigns, which demonstrate the feasibility of eating plant-based meals without asking participants to give up meat entirely. Such initiatives not only help to build new competences (Mullee et al., 2017), but also create communities with a shared commitment toward a larger goal that can initiate participants into new practices (De Boer et al., 2014). To this point, Daly (2020) further suggests that a Stir-Fry Saturday/Sunday campaign might also be effective when it comes to disrupting weekend barbecuing practices in Australia or potentially replace the traditional concept of the Sunday roast. In addition, woks placed in public parks could also enhance Australia's outdoor cooking infrastructure (Daly, 2020).

Meanings can provide a bridge between different practices (Shove et al., 2012). When it comes to meaning, communication strategies, traditionally used by the meat industry, which aim to link meat eating with strength, health and wellness can also be used by the plant-based industry. This is in view of the fact that omnivores often believe that meat-free diets offer restricted food choices and are nutritionally inadequate (Malek et al., 2019). Documentaries such as *The Game Changers* which draw on a mixture of dramatic footage, scientific studies, and professional athletes to demonstrate the link between physical fitness and a plant-based diet (Psihoyos, 2019) is one such example. Another example includes the Forest Green Rovers, described as the UK's "only completely vegan" professional football club with an environmental conscience (BBC, 2016).

Finally, introducing other versions of sustainable meats—such as insect meat (Belluco et al., 2013; Caparros Megido et al., 2016) and *in-vitro* meat (Bhat et al., 2017)—could also encourage more sustainable versions of meat-eating. Overcoming consumption barriers, such as food neophobia (Hocquette, 2016), may involve presenting these newer meats in more familiar and recognizable food formats, such as an insect-based burger (Caparros Megido et al., 2016). Furthermore, increasing consumer knowledge of the health benefits of these alternative protein sources (De Boer et al., 2014) may also assist in overcoming potential consumption barriers.

Future Research Directions

For future studies, researchers may need to consider a segmented approach to meat-eating, considering there has been limited insight into the practices of heavy, medium, and light meat-reducers (De Boer et al., 2014; Dagevos, 2016). Findings from a Dutch study on meat reduction revealed some significant differences in that "ethical meat-reducers" who consciously cut back on meat consumption differed from the "extravert meat-reducers" who were more motivated by social status (Dagevos and Voordouw, 2013). These segments, in turn, differed from "disengaged meat eaters," who reported low to moderate levels of motivation to change their consumption practices (Dagevos and Voordouw, 2013). These potential differences in consumption practices could also explored among Australian meat-eaters as well.

As highlighted previously, changes to Australia's immigration policy in the late 1950s led to subsequent changes to Australia's cultural diversity (Hugo, 2006) and eating practices (Wahlqvist, 2002; Crook, 2006). Thus, future research on this topic could further delve into the influence of different cultures on Australian eating practices, and also how eating practices might potentially differ across Australian sub-cultures. This is in view of the fact that Australia has one of the most culturally diverse populations in the world (Gallegos et al., 2019) with more than a quarter (26%) of Australians born overseas, and 19% born in countries where English is not the first language (Australian Bureau of Statistics, 2016a).

In addition, future research could also look beyond consumption practices (Dagevos, 2016) and consider ways to engage policy makers to help increase public awareness of the unsustainability of meat and encourage receptiveness toward meat reduction practices in general (Dagevos and Voordouw, 2013). All of this, in tandem, might help encourage further shifts toward more sustainable eating, which the Food Agriculture Organization of the United Nations (2018) defines as a system where both nutrition and food security are delivered in an economically, socially as well as environmentally sustainable manner to meet the needs of the present as well as future generations.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/supplementary material. Further inquiries can be directed to the corresponding author.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the Human Research Ethics Committee at the University of Technology Sydney (ETH18-2328). The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

TK conceived of the presented idea and developed the initial theory. CR and MR verified the analytical methods. CR and MR supervised the findings of this work. All authors discussed the results and contributed to the final manuscript.

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