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Consumers' Behaviors and Attitudes toward Doggy Bags: Identifying Barriers and Benefits to Promoting Behavior Change

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ABSTRACT

This study identifies barriers and benefits of consumers' current doggy bag behaviors and provides the information required to run an effective community-based social marketing campaign encouraging consumers to take their uneaten restaurant and café food home. This is done by applying a two-stage methodology, including quantitatively analyzing existing survey data and qualitatively investigating focus group discussion. Multiple barriers to widespread doggy bag participation were common and varied for different individuals and included both convenience and social stigma-related factors. The rational appeal of "saving money" was found to be the most effective motivator for encouraging doggy bag usage, especially for women, young people, students/unemployed, and low-income earners. Social marketing strategies and behavior change tools can be developed to remove the barriers and enhance the benefits of using doggy bags, such as developing positive social norms around using doggy bags and highlighting the financial incentive of using them. This research contributes to a limited but growing literature on out-of-home food waste and provides practicable insights for both public policy and for the food service sector for future initiatives aiming to reduce food waste.

KEYWORDS

Food waste; doggy bags; consumer behavior; focus groups; survey

Introduction

According to the Food and Agricultural Organization of the United Nations, 42% of total food produced was wasted or lost in the North America and Oceania region, with 61% of this food loss and waste occurring at the consumption level (Lipinski et al., 2013).

Consumers' plate waste in restaurants and cafés is one of the major sources of "out-of-home" waste (Parfitt et al 2013). While the "in-home" household waste issue has been widely investigated (Grandhi & Singh, 2016; Porpino, Wansink, & Parente, 2016), there is scant literature that has

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addressed “out-of-home” plate waste, with the notable exception of investigation of waste in hospitals and schools. For example, Buzby and Guthrie (2002) reviewed the plate-waste literature and discussed the strategies to reduce plate waste in school nutrition programs and William and Walton (2011) reviewed the plate waste in hospitals, and methods of its measurement, likely causes, and possible strategies to reduce plate waste. The lack of academic focus on “out-of-home” plate waste is surprising given the amount of food wasted when eating out is likely to increase with rising incomes and changing lifestyles resulting in an increase of “out-of-home” food consumption (Giorgi, 2013). One area where there is an obvious gap in out-of-home food waste knowledge is with regards to plate waste in restaurants and cafés. “Doggy bags,” in particular, would seem to be an obvious place to start intervention investigations given the apparent ease and effectiveness of implementation.

A doggy bag is a container or bag for leftovers that customers of restaurants or cafés can take home (Merriam-Webster. (n.d.)). According to Rhodes (2011), the expression “doggy bag” originated when restaurants and hotels in the United States started to provide their customers waxed paper bags to take their leftovers home for the family dogs. After that, consumers started to ask to take their leftovers home for themselves, and calling it a doggy bag was simply meant to cover their embarrassment. Today, the term doggy bag has become a common expression and consumers now have usually no intentions to give the leftovers to their dogs and the container is not even a “bag” at all.

In an attempt to reduce plate waste in restaurants and cafés, several doggy bag campaigns have been developed and launched around the world. Eschewing the term doggy bag is a common European habit and asking for a doggy bag is considered as a social stigma in many European countries (Canon, 2016). “Goodie bags” were launched by Juul’s organization in Denmark, featuring the word “doggy” crossed out to encourage consumers to take their leftovers (Bloom, 2016). In France, a new law came into effect on New Year’s Day in 2016 that forces restaurants to provide doggy bags to customers, if requested (Chazan, 2016). This regulation aims to reduce the large amount of food waste in France due to French consumer’s reluctance to eat leftovers. According to Canon (2016), the Swedish consumer association Konsumentföreningen Stockholm organized a campaign called Släng Inte Maten (Do Not Throw Away Your Food) to promote the use of doggy bags by providing public education to both consumers and industries about the reduction. Milan’s Department of Health, *Cena dell Amicizia*, launched a campaign called *Il Buono Che Avanza* (The Good That Advances) in Milan (Canon, 2016). This campaign aimed to promote social acceptance for doggy bags and encourage fashionable Milanese diners to take both food and wine leftovers home.

In New Zealand, there has been no specific doggy bag-related campaign to date. There is a small national discussion about the place of doggy bags in New Zealand society, however, which has been spurred by the recent public declaration by a restaurant on the Kapiti Coast that has refused to offer doggy bags because the owners did not want to get blamed by their consumers for leftovers making them sick (Fallon, 2016). Fallon (2016) also reported that another restaurant in Pauatahanui of New Zealand also discourages its customers from taking leftovers home because of the health and safety risks caused by reheating. These reactions have stirred much mixed reaction from the public, many of whom seem to want doggy bags to be made available. The current “hot” climate surrounding this issue makes New Zealand an interesting place in which to investigate doggy bag attitudes and behaviors. The hospitality industry in New Zealand is divided into five sectors: restaurants and cafes, takeaway food services, catering food services, pubs, taverns and bars, and clubs (Restaurant Association of New Zealand & AUT, 2013). The hospitality report of 2013 reported that the restaurants and cafés in New Zealand held up to 50% of the hospitality market share in 2012, and up to 49% of outlets nationwide (Restaurant Association of New Zealand & AUT, 2013). A survey showed that 69% of New Zealand respondents love to eat out at least once a month and 32% at least once a week (Restaurant Association of New Zealand, 2010). Therefore, plate waste in restaurants and cafés is likely to take a large proportion of New Zealand’s total amount food loss and waste.

The overall aim of this study was to support consumers’ efforts aiming to reduce food waste when eating out. More specifically, (a) to identify barriers and benefits associated with consumers’ current doggy bag attitudes and behaviors, and (b) to provide information to be able to run an effective nationwide community-based social marketing campaign encouraging consumers to take their uneaten restaurant and café food home.

This research makes both theoretical and practical contributions. First, the research contributes insights and knowledge to a field of limited literature on consumer barriers and opportunities in community-based social marketing campaigns and creates a base for future studies on the topic of plate waste and doggy bags in restaurants and cafés. Second, the research also makes practical contributions to both public policy as well as the hospitality industry by providing an understanding of consumers’ attitudes and practices toward doggy bags and a strategy for how to successfully reduce plate waste by promoting effective doggy bag usage messages.

Literature review

In order to reduce the negative social, environmental, and monetary impacts caused by food wastage (for an overview, see Mirosa, Pearson, & Pearson, 2016), there is a need to develop strategies to reduce food waste. Instead of feeling guilty about wasting food, it is important to encourage people to feel empowered to reduce waste (Stuart, 2009). The World Resources Institution suggested, “Reducing food loss and waste could be one of the leading global strategies or “menu items” for achieving a sustainable food future” (Lipinski et al., 2013).

Plate waste is defined as the quantity of edible portions of food served that is uneaten at the consumer and foodservice levels (Buzby & Guthrie, 2002). Possible approaches to reduce plate waste are discussed in several papers. WRAP’s report suggested that “offering more choice of portion sizes,” “allowing consumers to have starter as a main,” and “staff offering more information about portions” would give consumers more choice and empower them to order “the right amount” of food (Giorgi, 2013). Giorgi (2013) was also suggested that venues offer doggy bags for customers who left any food. In addition to “asking for smaller portions” and “bringing home leftovers,” Waldman (n.d.) suggested “sharing restaurant meals,” “replating’ unfinished meal and giving to someone in need,” and “supporting sustainable restaurants that donate excess food or compost their kitchen scraps.”

In terms of attitudes and practices more specific to doggy bags, WRAP researched consumers’ “out-of-home” food waste behaviors in 2012. Its quantitative survey showed 74% respondents in favor of being offered a doggy bag to take leftovers home as an option to reduce the amount of food left when eating out (Giorgi, 2013). This study found that a few participants do not understand the meaning of doggy bags and regarded it as food taken home for dogs, and some participants felt the name of doggy bag was derogatory. A large proportion of participants would only take away food in both quantity and value such as meat. Over half of the respondents had asked for a doggy bag before and 55% of them were women. More than 40% of participants thought it would be embarrassing to ask for a doggy bag. Some also said other countries did not have a norm of using doggy bags. When consumers were offered a doggy bag, they considered this to be good service. Several participants had not been offered a doggy bag for health and safety reasons. Participants who were refused a doggy bag considered this bad service and this experience decreased their future willingness to ask for a doggy bag. When participants were asked to propose an option to reduce plate waste, only 8% mentioned doggy bags. Women (81%) were more in favor of being offered a doggy bag than men (68%) (Giorgi, 2013).

In order to identify opportunities to reduce plate waste through a formal doggy bag service, Zero Waste Scotland (2014) implemented a pilot study in 2014 over an 8-week period. Sixteen restaurants in Glasgow and Edinburgh representing a range of cuisines took part in the scheme. These restaurants provided customers fully compostable cardboard boxes and paper carrier bags branded “good to go” to take leftovers home. The boxes and bags were labeled and included information on storage and reheating. Table topper cards and staff posters were placed in the restaurants to promote the availability of the take-home service. The Scottish study found that over the 8-week period, an average of a 42% reduction was measured in diners’ plates per participating restaurant. Diners taking food home caused half of the reduction, and the other reasons were adjusting portion sizes, changed menu options, and asking diners if they wanted sides. The survey showed 92% of diners who took food home ate it later, and the rest was composted or recycled. Over 1,400 “good to go” boxes were given out, which equaled around 240 kg of food. This national scheme also encourages consumers to change their behaviors to using a take-home service. The pilot scheme also made the use of a take-home service more socially acceptable and made the consumers think it is a “normal” thing to do. The additional benefit was this pilot scheme made the participating restaurants upsell, because diners might purchase extra courses to take home. The limitation of this scheme was that it was not suitable for all situations (Zero Waste Scotland, 2014). A “good to go” box could not solve the situation when there was not enough food left on the plate. Diners were unlikely to take a “good to go” box for special occasions such as a function or fine dining. The box was not suitable for pre-cooked food to reheat for a third time. Fast food and low-end restaurants were not measured because they were excluded. It was also not effective for high-end restaurants because diners tended to leave less or had special occasions.

Sustainable Restaurant Association (SRA) research found UK restaurants produced 21 tons of food waste per year, and an estimate of 30% of it was plate waste. In order to raise consumer and industry awareness about restaurant food waste issues, the SRA launched a “Too Good To Waste” campaign in London in 2011 (Too Good To Waste, n.d.). It targeted both consumers and restaurants by offering them alternatives of “Too Good To Waste” boxes. Restaurants could sign up to the campaign by offering consumers the fully recyclable and biodegradable doggy bags for their leftovers. While these case studies offer interesting insights into the issue, the literature is scant and would benefit from a more in-depth and nuanced investigation of consumers’ attitudes and behaviors toward doggy bags. The most relevant study to date is the work of Sirieix, Lála, and Kocmanová (2017), which provides an understanding of how consumers’ concern about food waste, culture, social

norms, and emotions contribute to consumers' attitudes and behaviors relate to doggy bags in two countries: France and Czech Republic. This work highlights conflict that arises when personal norms (not to waste food) and social norms (to not eat leftovers) clash. Whilst people in both countries held positive attitudes toward the doggy bag concept, there was a widely held perception that doggy bags were for people with financial problems (i.e., that could not afford to waste the food). Their study recommended that doggy bags be seen as a social innovation, requiring appropriation and social identification.

Given food cultures are culturally determined (Rozin, 2005), doggy bag attitudes and practices are likely to be also culturally determined, so evidence from another case study (i.e., New Zealand) will also help to provide a more robust understanding of how to promote this beneficial behavior (or social innovation) more widely. In particular, we pick up on the finding of Sirieix et al. (2017) that doggy bags were perceived to be for people suffering financial difficulties and explore this attitude further in our New Zealand-based study population by digging down into the perceived effectiveness of different types of appeals for reducing restaurant or café food waste. Four main motivators are investigated (identified in the work of Pearson et al., 2017), identified as “save money,” “save guilt,” “save the planet,” and “save hungry people.” The potential effectiveness of the save money appeal in particular is an interesting appeal to investigate, given that it is widely used in food waste reduction campaigns worldwide targeting in-home food waste reduction. In New Zealand, in-home food waste research has demonstrated that the most common motivators to minimize the amount of food waste included the value placed upon food (main motivator for 88% of the nationally representative study population) and the possibility of saving money (84%) (WasteMINZ, 2014). This report found that high food wasters are less likely to be motivated by the above factors than medium and low wasters but that they were still key motivators for these households. Associations with income levels (or any other demographic variables) were not measured. Based on these results (i.e., that the value placed on food and saving money are the most influential motivators for reducing food waste at home and to a lesser extent save guilt, the environment, and hungry people), these messages are now being disseminated as part of a nationwide Love Food Hate Waste campaign (<https://www.facebook.com/lovefoodhatewastenz>). This campaign is an application of the highly successful Love Food Hate Waste campaign that has been running in the United Kingdom (UK) for the last 20 plus years and elsewhere in the world as well.

The theoretical framework: community-based social marketing

Reducing consumers' plate food waste requires changing consumers' wasting behaviors. Human behaviors are always changing, according to their changeable environment and increasing personal cognition of society (Borland, 2013). Altering consumer preferences, however, is not creating new behavior argued McKenzie-Mohr (2000a). It is important to understand the difficulties of behavior change. Borland (2013) found that sometimes humans did not behave according to their desired lifestyles, even though they were trying to achieve them and these lifestyles were more positive and beneficial. It was also found that it was difficult to maintain healthy behaviors. Community-based social marketing is a strategic approach program used to overcome barriers related to behavior change. According to McKenzie-Mohr (2000b), community-based social marketing is an approach that identifies the barriers of the promoted activity, defines strategy to overcome the barriers, then pilots the strategies to achieve the broad sustainable behavior in communities, engaging both knowledge from psychology and social marketing. The first step is uncovering the barriers and identifying the behavior being promoted (McKenzie-Mohr, 2000a). The next step is designing strategies to overcome the barriers uncovered. The third step is piloting the strategies before broad implementation. The final step is evaluating the effectiveness of the strategies. McKenzie-Mohr and Schultz (2012) determined eight different tools of behaviors intervention: commitments, social diffusion, goal setting, social norms, prompts, incentives, feedback, and convenience. The Institute for Government proposed a "Mindscape checklist" for changing behaviors (Dolan, Hallsworth, Halpern, King, & Vlaev, 2009). The nine tools include messenger, incentives, norms, defaults, salience, priming, affect, commitments, and ego.

Methods

This study utilized a mixed-method process, combining quantitative survey data with qualitative focus groups. In both data collections, restaurants and cafés were defined as all dine in eateries (excluding takeaways and fast food chains such as McDonalds).

Survey

An existing online nationwide survey data set, collected by the first and second author of the current study, called "Consumer Food Waste in Restaurants/Cafés" was analyzed to investigate domestic doggy-bag-related plate food waste practices and attitudes in New Zealand restaurants and cafés. This survey aimed to understand NZ consumers' restaurant and café

plate food waste practices and attitudes. It also aimed to investigate how to improve those practices to reduce plate waste by understanding participants' thoughts and ideas related to these issues. A subset of questions relating to doggy bag usage and attitudes were extracted for the current study. The questions are presented in [Table 1](#). An online reward program called Valued Opinion was used to recruit the participants. Criteria were consumers over 18 years old who had eaten in restaurant or café at least once over the last month. Individuals employed in the hospitality industry were excluded. Raw data were exported from Qualtrics as a spreadsheet and then inputted into SPSS for further analysis. A report of results to each question was also exported from Qualtrics for analyzing. Cross Tabs function in SPSS was used to analyze the significant relationships between questions.

Focus groups

While nationwide survey data showed quantitative trends in domestic plate food and doggy bag practices in restaurants and cafés, conducting qualitative research helped to provide more in-depth and wider perspectives. After completing the survey data analysis, three focus groups were conducted in Dunedin, New Zealand. The focus groups investigated domestic doggy-bag-related behaviors and attitudes and potential strategies to reduce plate food waste by promoting doggy bag usage. The participants in the focus group had to meet the specific criteria; they had to be over 18 years old and had eaten in a restaurant or café within the past month. In order to capture all possible viewpoints, a diverse range of participants was recruited including those who “do ask” or “do not ask” for a doggy bag when eating out. Purposeful recruitment was used to recruit the participants. Advertising posters were placed on notice boards 2 weeks before the focus group sessions. A public event page that detailed the focus group information was created on Facebook to invite participants. “Word of mouth” recruitment was used to recruit further participants as the recruitment progressed. A total of 27 respondents were recruited to three sessions of focus group.

Each session included 8–12 participants. Photos of existing New Zealand doggy bags were provided as visual aids (see [Figure 1](#)).

Next, the Moderator asked 14 open-ended doggy-bag-related questions developed to investigate consumers' behaviors and attitudes toward doggy bag usage and opinions toward doggy-bag-promoting strategies (presented in [Table 2](#)). The three sessions lasted between 40 and 60 min per session.

The focus group data were analyzed using thematic analysis, a method for identifying, analyzing and reporting themes within data. A theme is described as capturing the importance about the data related to the research question, and representing level of patterned responses within the data set (Braun & Clarke, 2006).

Table 1. Questions extrapolated from the wider national survey “Understanding consumer’s restaurant/café plate waste” analyzed in this study.

Q. How many other people dined or purchased food with you?

None; 1; 2; 3; 4; 5; 5+

Answer if How many other people were with you? None Is Not Selected.

Q. Did other people in your party leave food on their plate at the end of the meal?

Yes; No; Don’t know.

Q. Did you have any food left over on your plate at the end of this meal?

Yes; No.

Answer if Did you have any food left over on your plate at the end of this meal? Yes Is Selected.

Q. Please estimate approximately how much edible food (i.e., not bones) was left on your plate at the end of that meal.

Less than a tenth; Between a tenth to less than a quarter (10–24%); Between a quarter to less than a half (25–49%); Half or more (>50–100%).

Answer if Did you have any food left over on your plate at the end of this meal? Yes Is Selected.

Q. Did the restaurant or café staff offer you a doggy bag (i.e., a container for leftover food) to take home this uneaten food?

Yes; No.

Answer if Did restaurant or café staff offer you a doggy bag to take home this uneaten food? Yes Is Selected.

Q. Did you take this food home?

Yes; No.

Answer if Did you take this food home? No Is Selected.

Q. Please explain why you did not take this food home:

Answer if Did you have any food left over on your plate at the end of this meal? Yes Is Selected.

Q. Did you ask staff for a doggy bag?

Yes; No.

Answer if Did you ask staff for a doggy bag? No Is Selected.

Q. Why did you not ask staff for a doggy bag? (Tick as many as applicable)

Too embarrassed to ask; Worried what others would think; Not enough food left on my plate to bother; Was not convenient (e.g., not going directly home); I knew this restaurant or café doesn’t offer doggy bags; Other (please specify).

Answer if Did you ask staff for a doggy bag? Yes Is Selected.

Q. Were you given a doggy bag?

Yes; No.

Answer if Were you given a doggy bag? No Is Selected.

Q. How did you feel about this? (Text)

Answer if Were you given a doggy bag? No Is Selected.

Q. What were the reasons given for the refusal? (Text)

Q. Please indicate your level of agreement with the following statements: “I would be too embarrassed to ask for a doggy bag to take home any uneaten food”
Strongly disagree; Disagree; Somewhat disagree; Neither agree nor disagree; Somewhat agree; Agree; Strongly agree.

(Continued)

Table 1. (Continued).

Q. How many other people dined or purchased food with you?

Q. For each of the following statements, please indicate which option best reflects your situation regarding reducing your own restaurant or café food waste: "Taking home a 'doggy bag' at the end of a meal at a restaurant/café."

I make no effort in doing this and have no plans to start doing so; I make no effort in doing this, but I am thinking about it; I make no effort in doing this, but I have decided to start on it; I am already doing this.

Q. Have you ever asked for a doggy bag in a restaurant or café and been refused?

Yes; No.

Q. Please indicate what you think about "Staff to offer you the option of taking home leftovers (e.g., a doggy bag)" as a strategy which could be implemented to reduce food waste in a restaurant or café setting.

Very bad idea; Bad idea; Neither good idea or bad idea; Good idea; Very good idea.

Q. Please indicate how effective the following motivations would be in convincing you to reduce your restaurant or café food waste: (1) Save money (wasting food wastes money); (2) Save the planet (wasting food wastes natural resources); (3) Save hungry people (some food wasted could feed those in need); (4) Save guilt (some people regret and are frustrated when they waste food).

Very ineffective; Ineffective; Somewhat ineffective; Neither effective nor ineffective; Somewhat effective; Effective; Very effective.



Plastic Containers



Styrofoam containers



Bagasse Compostable Container



Kraft Paper Bags

Figure 1. Doggy bag visual aids for focus groups.

Table 2. Focus group questions.

Do you normally use a doggy bag in a restaurant or café? Why do you use/not use it?
 Can you think of any other reasons why other people “do ask”/“do not ask” for a doggy bag?
 What would you think if a restaurant/café staff asked you whether you needed a “doggy bag” or not at the end of your meal? Would you like it or not? And why?
 Have you ever been refused a doggy bag before? (*For those who say yes*) How did you feel about that?
 Have you ever not taken the doggy bag when you were offered one by the staff? (*For those who answer yes*) Why?
 (*Showing participants the pictures or the real objects of doggy bags*) What types of current “doggy bag” from the restaurant/café do you like/dislike? Why?
 Do you have any suggestions to improve these example doggy bags?
 What do you think about the strategy to promote doggy bag usage to reduce plate food waste in a restaurant/café? Do you like it or not like it?
 What will you think if there are posters about reducing food waste in a restaurant/café to encourage doggy bag usage?
 What would motivate you to use a doggy bag to reduce plate waste? (e.g., Save money? Save the planet? Save hungry people? Or save guilt?)
 How do you feel about the name doggy bag?
 How do you feel about changing the name doggy bag to encourage its usage?
 Do you have any other ideas about encouraging doggy bag usage in restaurants/café?
 Is there anything else you would like to share with us before we finish up?

Results and discussion

Table 3 presents an overview of the participants for both sources of data. Of the 1,004 survey participants, 52.3% were women and 47.4% were men. The age range of the respondents was 18–74 years old and the group aged from 55 to 64 represented the highest proportion (23.4%). The highest proportion of personal annual income group was from \$40,000 to \$59,999 (20.52%). In terms of occupation, 67.9% of respondents were in paid work, 25% were unemployed (includes sickness or domestic purpose benefit, home duties, retired), and 7.1% were students. For the focus groups, with over half (55.6%)

Table 3. Overview of survey and focus group participants.

Characteristics	Survey (%) <i>n</i> = 1,004	Focus group (%) <i>n</i> = 27
Gender		
Male	47.4	37.04
Female	52.3	63.96
Prefer not to say	0.3	0
Age		
18–24	10.77	55.56
25–34	19.42	22.22
35–44	20.62	18.52
45–54	21.81	3.70
55–64	23.4	
64+	3.98	
Occupation		
In paid work (full time or part time—includes self-employed)	67.9	22.22
Unemployed (includes sickness or domestic purpose benefit, home duties, retired)	25	7.41
Student	7.1	70.37
Personal income before tax per annum		
Less than \$20,000	15.94	*\$0–\$9,999 48.15
\$20,000–\$39,999	14.64	\$10,000–\$24,999 18.52
\$40,000–\$59,999	20.52	\$25,000–\$49,999 11.11
\$60,000–\$79,999	13.35	\$50,000–\$74,999 3.7
\$80,000–\$99,999	8.67	\$75,000 0
\$100,000–\$149,999	8.27	Prefer not to say 18.52
\$150,000–\$199,999	2.59	
\$200,000–\$399,999	0.6	
\$400,000 or more	0.4	
Prefer not to say	15.02	
Race/Ethnicity		
European	*	44.44
Asian	*	48.15
Middle Eastern/Latin American/African	*	3.70
Other ethnicity	*	3.70
Taking home a doggy bag at the end of a meal		
I make no effort in doing this and have no plans to start doing so	9.4	0
I make no effort in doing this, but I am thinking about it	15.8	11.11
I make no effort in doing this, but I have decided to start on it	13.5	3.7
I am already doing this	61.3	85.19

*Note that the income brackets were not the same for the survey and focus groups. The nationwide survey did not collect race/ethnicity data.

of the participants under the age of 24 years and 77.8% not in paid work (7.4% unemployed, 70.4% student), it is important to note that the demographic profile of the focus groups participants varied considerably to that of the broadly representative national survey sample.

Survey analysis

When the respondents were asked about their last dining experience at a restaurant or café, 34.3% of them claimed that they left food at the end of their meals, and 44.4% said other people on the table left food in their plates at the end of their meals. When respondents were asked about the percentages of food generally left (i.e., on average, not just for the last eating episode as per the previous question), 38.3% claimed that they did not leave food and 68.7% typically left food on plate.

Results of answers with “yes or no” options are presented in Figure 2. It showed that 25.1% of respondents who left food at the end were offered a doggy bag by the restaurant or café staff and 69.3% of them took the food home. For those who answered having food left but not being offered a doggy bag, 5.3% asked the staff for a doggy bag to take the food home and 85.7% of them were given a doggy bag. Results showed 21.4% of all respondents were refused a doggy bag when asking.

Associations with gender were found to be significant ($p = 0.046$) between answers for “Did you ask staff for a doggy bag?” Results showed women were more likely to ask staff for a doggy bag. It was also found that respondents in paid work were more likely to not ask for a doggy bag ($p = 0.042$). The reasons why those who were not offered a doggy

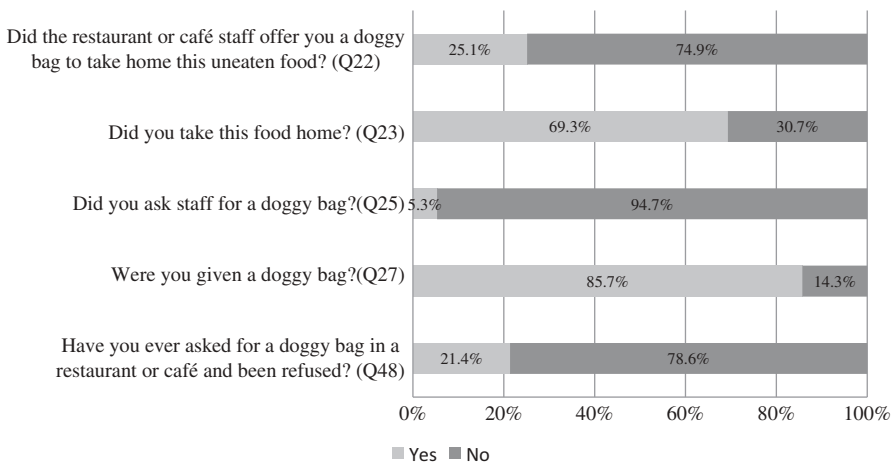


Figure 2. Responses to “Yes or No” questions related to doggy bag.

bag were presented in Figure 3. Of the respondents, 43.1% thought that there was not enough food left on their plates to take home, which was the highest chosen reason. Only 5.8% of them thought that it would be too embarrassing to ask.

Interestingly, when asked about more general opinions about their embarrassment toward asking for a doggy bag on a 9-point scale, 17.2% of participants thought that it would be embarrassing to ask for a doggy bag, and 70.9% disagreed. For those who selected “Other,” major reasons given were disliking the food being left and thinking the leftover food was not appropriate for reheating. When respondents were asked why they did not take the food home if they were offered a doggy bag by the restaurant/café staff, the main reasons elicited were “not enough food left on plate” and “inconvenience.”

Respondents were also asked to give their current practice of using a doggy bag. Over half of those surveyed (61.3%) claimed to use doggy bags to take uneaten food home, 13.5% currently made no effort but had decided to start on it, 15.8% currently made no effort but are thinking about it, and 9.4% was not and did not plan to use a doggy bag in the future. The “thinking about it” and “decided to start on it” groups (which amounted to 29.3% of total participants) could be the potential target group to promote doggy bag usage.

Respondents were asked to rate their attitudes to “Staff to offer you the option of taking home leftovers” as a strategy to reduce plate waste on a 5-point scale, where 1 represented “very bad idea” and 5 represented “very good idea.” The mean score calculated for this question was 4.3, which was between “good idea” and “very good idea.”

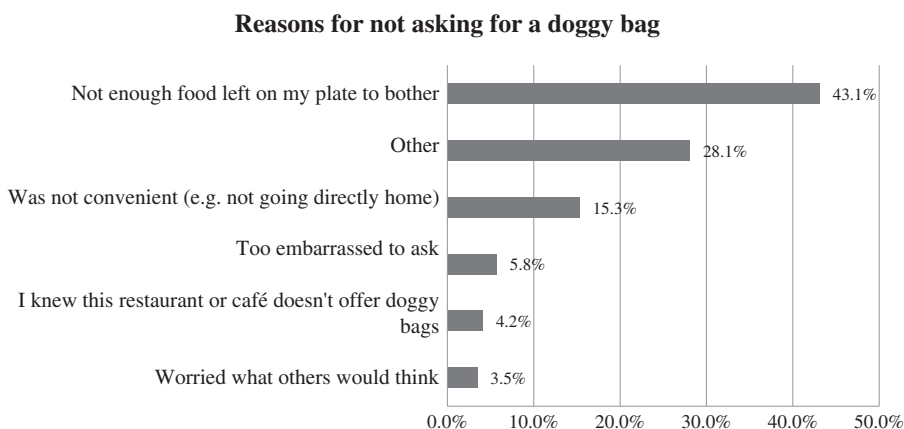


Figure 3. Responses to question “Why did you not ask staff for a doggy bag? (Tick as many as applicable).”

When respondents were asked to evaluate the effectiveness of different motivations to reduce food waste (Figure 4), “save money (wasting food wastes money)” was regarded as the most effective motivation.

The mean score was 5.38, between “somewhat effective” and “effective.” “Save guilt (some people regret and are frustrated when they waste food)” was evaluated as the least effective motivation, with a mean score of 4.48, between “neither effective nor ineffective” and “somewhat effective.” However, all four motivations were considered as possible motivating appeals given their average scores were all above 4.0 (“neither effective nor ineffective”). Motivations to reduce plate waste shared no significant correlation with current plate waste behavior (results available upon request).

A closer look at the relationship between the importance of saving money as a motivator for using doggy bags and gender (Figure 5) shows that 45.6% of all males and 56.9% of all females are likely to be influenced by financial savings (i.e., they rated the save money motivator in the top two categories on the seven point scale, as “very effective” or “effective”).

The “saving money” motivator was generally more important for those on lower incomes than those who earn more (Figure 6). A closer look at this relationship revealed that there was a significant correlation ($p = 0.05$) between personal income and the importance of saving money as a motivator for using doggy bags (-0.069).

Younger people (i.e., under 44 years of age) are more motivated by this monetary-based appeal, with 71% of people aged 35–44 stating that promoting financial savings associated with doggy bags use would be “very effective”

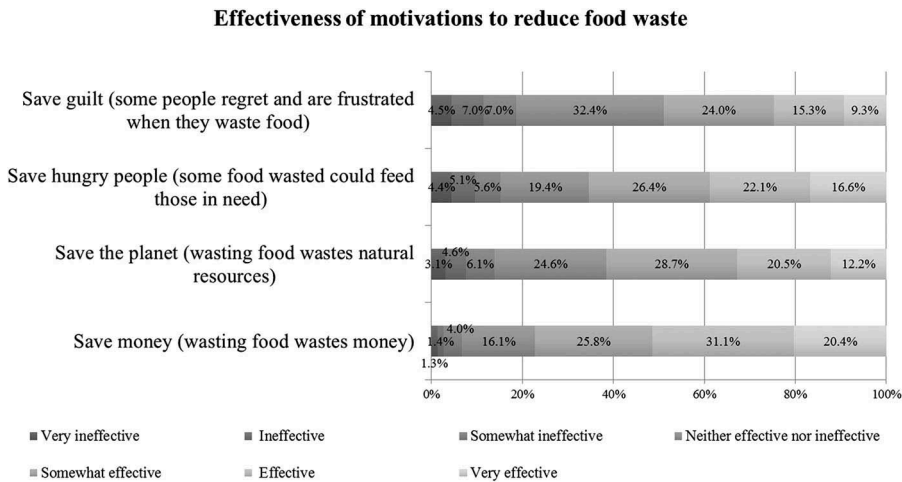


Figure 4. Responses to question “Please indicate how effective the following motivations would be in convincing you to reduce your restaurant or café food waste.”

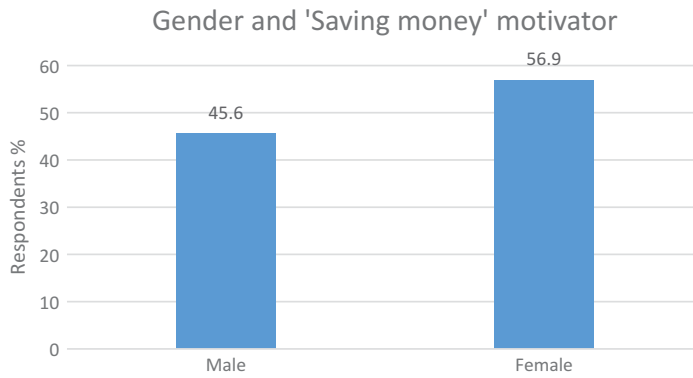


Figure 5. Gender and the importance of “saving money” as a motivator for reducing restaurant or café food waste.

Note: Respondents’ percentage who rated the save money motivator in the top two categories on the 7-point scale (“very effective” or “effective”).

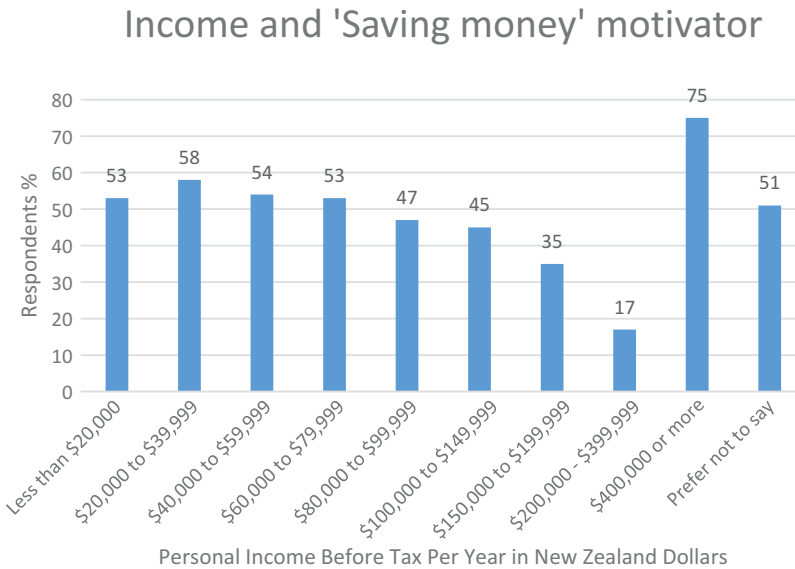


Figure 6. Income and the importance of “saving money” as a motivator for reducing restaurant or café food waste.

Note: Respondents’ percentage who rated the save money motivator in the top two categories on the 7-point scale (“very effective” or “effective”).

or “effective” for them and 57% of people 25–34 and 61% of people aged 18–24 also agreeing (Figure 7).

Occupation also seems to be related to the deemed importance of this motivator, with the unemployed and students rating saving money as either very effective or effective (66% and 63%, respectively) (Figure 8).

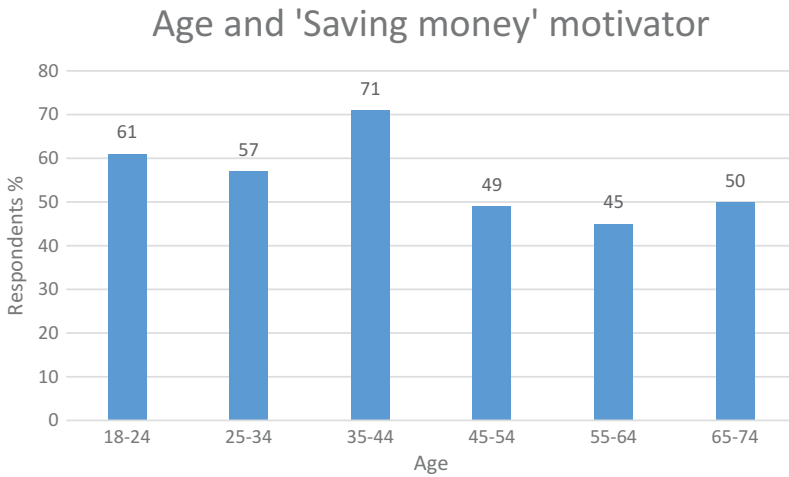


Figure 7. Age and the importance of “saving money” as a motivator for reducing restaurant or café food waste.

Note: Respondents’ percentage who rated the save money motivator in the top two categories on the 7-point scale (“very effective” or “effective”).

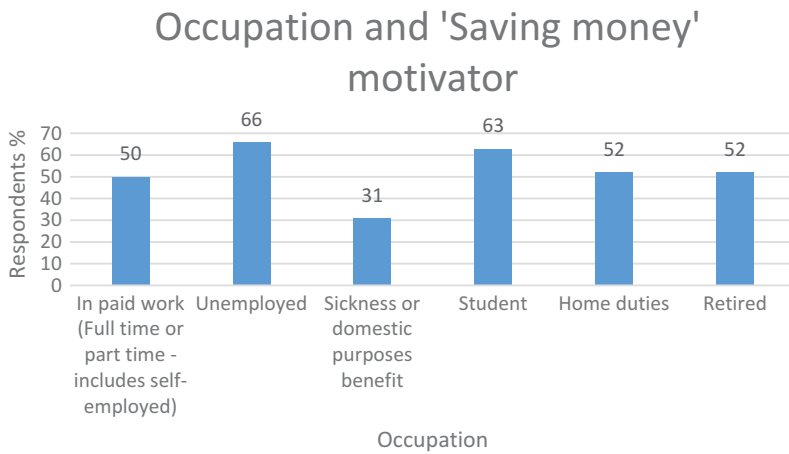


Figure 8. Occupation and the importance of “saving money” as a motivator for reducing restaurant or café food waste.

Note: Respondents’ percentage who rated the save money motivator in the top two categories on the 7-point scale (“very effective” or “effective”).

Focus groups

It is important to reiterate that the demographic makeup of the focus groups was mainly young students and as such the following findings need to be interpreted in this context. Importantly, as [Table 1](#) shows, 85.2% of focus group participants were already taking home a doggy bag

at the end of a meal at a restaurant/café (compared to only 61.3% of survey participants), 3.7% were making no effort in doing this but have decided to start (compared to 13.5%), 11.1% were making no effort to do this but are thinking about it (compared to 15.8%), and no participants had no plans to start doing so (compared to 9.4%).

Overview of themes

Key themes and subthemes from the focus groups are presented below in Figure 9. The three themes are defined from the focus group findings:

- Theme 1: Barriers and benefits of using doggy bags
- Theme 2: Attitudes toward doggy bag
- Theme 3: Strategies to promote doggy bag usage

Theme 1: barriers to and benefits of using doggy bags

When participants were asked about the reasons why they did not ask for a doggy bag if they have leftovers on their plate (responses in Figure 10), the most mentioned reasons (mentioned by 40.7% of all participants) was that

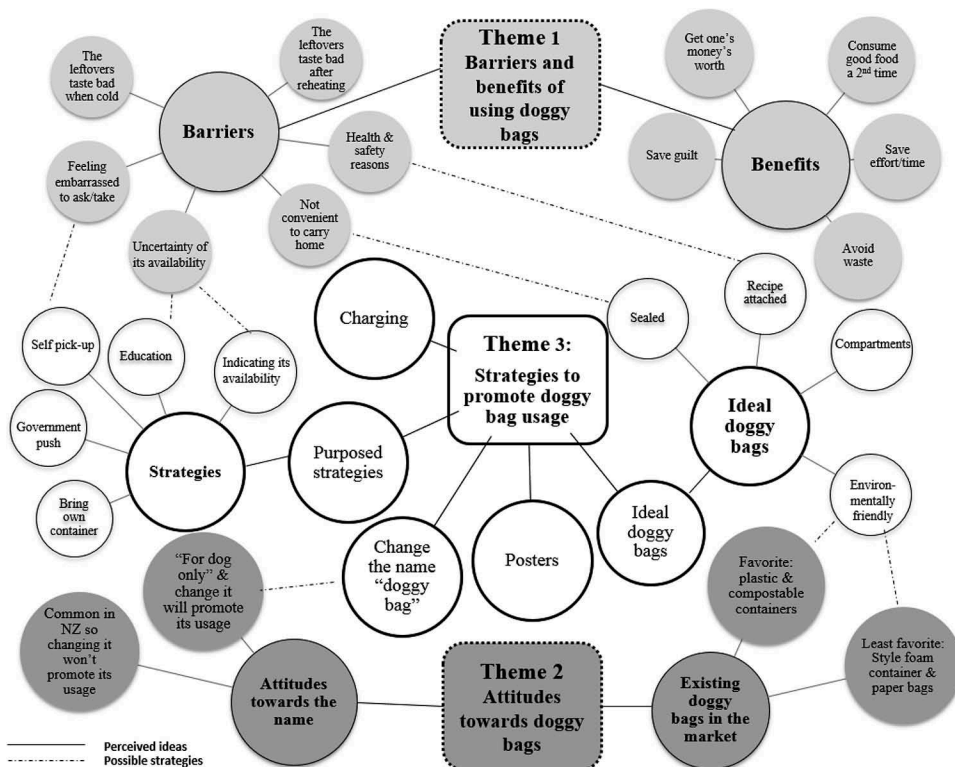


Figure 9. Theme map depicting focus group results.

Reasons for not asking for a doggy bag

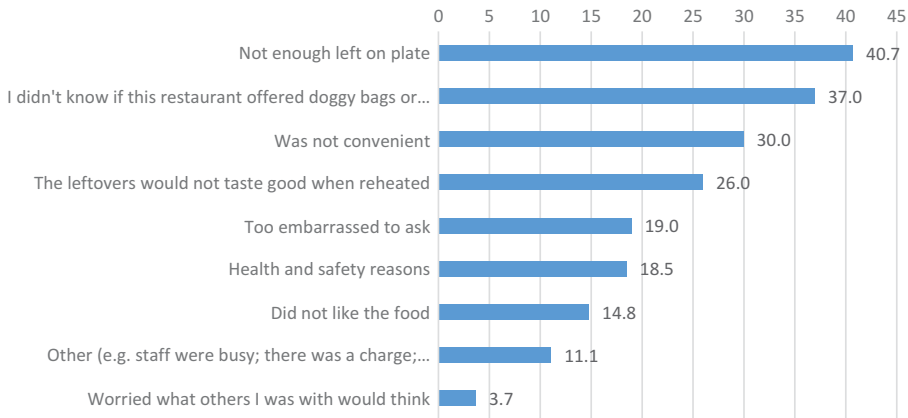


Figure 10. Focus group respondents' stated reasons for not using a doggy bag when they had uneaten food on their plate in restaurants and cafes (could mention as many as were relevant).

they did not have enough food left on the plate to take. The second biggest reason (37%) was that they did not know if the restaurant or café offered the doggy bag or not. “Inconvenience” was pointed out by 30% of participants, including the inconvenient design of doggy bags for creamy or liquid leftovers, which made them not suitable for carrying around if not going home directly after the meal. A few participants stated that they felt embarrassed to ask for a doggy bag (19%), especially at a high-end restaurant or café. If the leftovers were undesirable (14.8%) or were believed to taste bad after reheating (26%), they would not ask for a doggy bag to take home. Health and safety reasons were identified as a barrier as well (7.4% mentioned this). One participant had been refused a doggy bag by staff of a restaurant because of restaurant health and safety policy and another respondent mentioned that that they perceived was unhealthy/not safe to eat leftovers.

Saving money was found to be the biggest perceived benefit in asking for a doggy bag (mentioned by 15% of all participants). When participants were asked about the reasons why they asked for a doggy bag, “to get my money worth” was mentioned most (11.1%). Some participants could see the efforts paid by many people to create the food they enjoyed; for that reason, they did not want to waste the efforts and the food. An interesting addition to the four motivators used in the survey was the notion bought up by one participant of saving time/effort: “For me it’s more about effort. Like it takes time to cook, so I don’t have to do that.”

Theme 2: attitudes toward doggy bags

The attitudes toward the name of “doggy bag” were polarizing. Most New Zealand European participants thought the name was common in New

Zealand. Although a few of them called it by other names instead, most of these participants believed that changing the name “doggy bag” to something else would not promote its usage (despite a couple of suggestions that perhaps a name change might be effective for higher end restaurants and cafés). On the other hand, non-New Zealand Europeans (especially the non-native English speakers) reported that they had misunderstood the name when they heard it the first time. Thus, they believed that changing its name would be an effective strategy to promote its usage.

The existing doggy bags in the New Zealand restaurant or café were the plastic containers, paper bags, paper boxes, bagasse compostable containers, and Styrofoam containers. Participants’ favorite ones were the plastic containers and the compostable ones. Quality of the doggy bag was another motivation for using it. Some of them also reuse the plastic containers at home. The least favorite ones were the Styrofoam containers and the paper bags.

In regard to the motivations of using doggy bags to reduce plate food waste, the most effective motivation was saving money (mentioned by 19% of all participants), which was also the greatest benefit of using doggy bags. Some of them mentioned that the motivation was a combination of saving money and the environment (mentioned by 15% of all participants).

Theme 3: strategies to promote doggy bag usage

Negative attitudes were received from the respondents about using posters in restaurants and cafés to promote doggy bag usage. A few participants showed strong antipathy, especially if the content in the poster was reducing food waste. Participants suggested using a subtle way to advertise instead, such as through other media.

Nonlocal participants were more likely to accept a doggy bag charge, based largely on the fact that they had past experience in being charged for this service. In Asian countries like China, many restaurants charge for doggy bags. Therefore, participants who had that experience considered it normal. Conversely, in New Zealand, almost all restaurants and cafés provide free doggy bags, so New Zealanders’ attitudes to charging ranged from neutral to negative. As a result, implementing a doggy bag charge in New Zealand might decrease doggy bag usage because consumers might not be willing to pay for it.

In order to evaluate the strategy of designing a better doggy bag, the characteristics of ideal doggy bags were asked about during the discussion. The most suggested feature was making the doggy bag environmentally friendly (29.6% mentioned this). Participants also would like to see the changes to the functionality of the doggy bag, such as having

compartments inside to separate the meals and making it sealed (18.5%), and attaching a leftover recipe to it (14.8%).

When participants were asked to share their ideas about doggy-bag-promoting strategies, the most mentioned strategy (30%) was to let customers know that a doggy bag was available in the restaurant or café such as by mentioning it in the menu or by advertising it on the shop window. Additionally, having staff to ask the consumers if they need a doggy bag or not was mentioned as another alternative (7.4%). Participants believed that making the doggy bags self-pick-up in the restaurants or cafés so that customers can grab them by themselves would reduce the effort of asking for it and would save some potential embarrassment in asking (11.1%). One participant recommended that educating customers, especially children, to form the habit of asking for a doggy bag and reduce food waste would be effective. It was mentioned that working with a local council or nonprofit organization to develop and promote through different media a consumer education campaign would be effective. Two respondents suggested promoting the usage of customers own doggy bags from home. This was deemed to be an effective way to reduce the amount of doggy bag waste at home (i.e., if their own home containers were reusable). A complete overview of focus group respondents’ ideas on how to encourage doggy bag usage is presented in Figure 11.

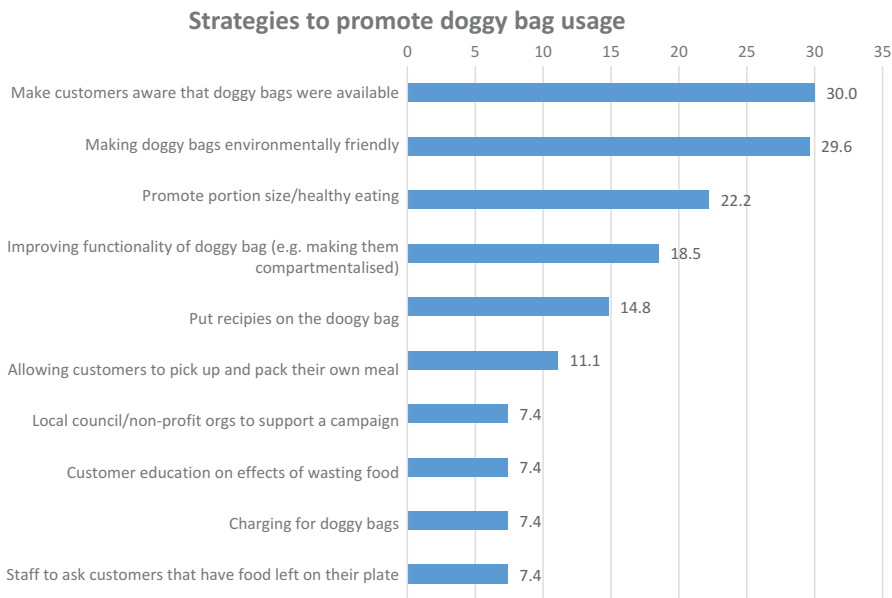


Figure 11. Focus group respondents’ ideas on how to encourage doggy bag usage in restaurants and cafes (could mention as many as were relevant).

Discussion

While previous research on leftovers has shown that these can be seen to be “psychologically contaminated” or “used” food (Rozin, 2014) and that only poorer people will be motivated by saving money by taking home leftovers (Sirieix et al., 2017), results from this study indicate that this isn’t the case in New Zealand. Most respondents held fairly positive attitudes toward the concept of doggy bags, with only 9.4% of survey respondents and 0% of focus groups respondents stating that they had no plans on using them in the future. Many of the barriers identified seem surmountable, if public–private partnerships are formed to work together to promote this behavior. Although some people in the focus groups did mention that they would be embarrassed to ask for a doggy bag, this embarrassment did not appear to stem from a belief that doggy bags were for the poor; rather, it was more influenced by the fact that it just wasn’t the normal (or socially acceptable) thing to do. This is therefore in contrast with the sentiments expressed in the work of Sirieix et al. (2017).

Appropriate behavior change tools need to be chosen. Social norm could be an effective tool to change consumers’ waste behaviors, by making doggy bags more socially acceptable. It can be advertised through different media suggesting that using a doggy bag is a “normal” thing to do. Prompts are another useful tool to change consumers’ plate-waste behaviors. Based on participants’ suggestions from focus groups, prompts about doggy bags can be placed in the restaurants or cafés. For example, a small table topper card can be placed to remind consumers the option of taking leftover home by asking staff a doggy bag. Porpino et al. (2016) proposed that communication with consumers could be more effective if behavioral economics principles were used, rather than blaming consumers or using persuasive message to increase awareness of food waste.

If persuasive messaging was to be used, then our survey and the focus group results indicate that framing communications about the benefits of taking home a doggy bag should be done in such a way as to tap into the main motivator identified, i.e., saving money. Framing the appeal in monetary terms (“taking your food home will save you money”) is a strategy that has been purported by food waste scholars Pearson and Perera (2018) as part of their recommendations for implementing an integrated social marketing campaign to reduce consumer food waste. Other research has also shown that the motivation for reducing waste is likely to differ according to who is responsible, such as those responsible for costs are more likely to respond positively to financial incentives (Goonan, Mirosa, & Spence, 2014).

One of the challenges of this approach, of course, is that saving money is unlikely to be of concern to all consumers (this was reflected in the survey data by the fact that people in paid work were less likely to ask for

a doggy bag). A closer examination of the perceived effectiveness of the save money appeal reveals that this appeal is most likely to be successful for selected target groups of consumers (i.e., female, young, student/unemployed, and low income earning). Despite the fact that this is often the dominant message pushed in existing food waste reduction campaigns, as food waste campaigner Tristram Stuart says in his 2009 book (Stuart, 2009), the problem is that food is relatively cheap and that has made us negligent about wasting it. The financial decision to buy more than needed has become ingrained in purchasing habits. Many people are still ok with paying for more than is needed and then throwing it away (e.g., have the attitude “I can afford it so why not”). Thus, appealing to wallets to motivate doggy bag usage will surely only address part of the problem. Further analysis of how to best integrate this money-based appeal with other known motivators (save the planet, save hungry people, and save guilt) and target these messages to identified segments of consumers (e.g., low, med, high food wasters) is the next step.

One participant from the focus group commented, “A lot of things you don’t eat when you are at the restaurant so maybe you wouldn’t eat it at home either, so it doesn’t actually prevent food waste. You just move the waste from your restaurant to your house.” The survey analyzed in stage one showed 8.2% respondents eventually threw away their leftovers, which they took home from the last meal. Therefore, in some cases, the act of taking leftovers home is not reducing food waste per se. Thus, promoting doggy bag usage alone cannot overcome all barriers of reducing plate-related food waste. The provision of information of how to safely store and reheat leftovers at home may go some way in helping to address this issue. Other tools that are being promoted for in-home food waste reduction management, such as checking the fridge before going shopping, and learning to find ways to include small amounts of leftovers into new meals, will also be helpful here.

Comparing with the WRAP’s report in 2012, several results from the focus groups are quite similar to their results indicating some cross-cultural similarities. For example, some participants in the focus groups (7.4%) misunderstood the meaning of the term “doggy bag,” understanding that this was food intended for the pets; both studies found that consumers would only take home foods of both good quality and quantity; and doggy bags were perceived to be a norm in the United States and a matter of course. Similarities in consumers’ attitudes such as these suggest that monitoring the successfulness of doggy bag initiatives elsewhere in the world (especially the UK) is worthwhile as there may well be many relevant learnings for New Zealand.

Conclusions and implications

A number of important public policy implications arise from this research. Awareness of the implications of food waste is important before we can expect people to act to reduce it. Given that consumers often felt that there was not enough food on their plate to bother taking it home, increased awareness of the social, environmental, and economic impacts of wasting food (even if it's not large quantities) might make people more inclined to reconsider acting to avoid it. We therefore encourage publicly funded social marketing campaigns to raise general public awareness of the consequences of wasting food waste. Given that the younger participants in the focus group had low awareness about the availability of doggy bags, it would be useful for the social marketing programs to also familiarize younger diners in New Zealand not just about the issue of food waste but also about the availability of doggy bags. Such campaigns could also play a role in helping to promote positive social norms around doggy bag usage and to diffuse existing negative norms that our data indicated are still held by some people. Consideration should be given to changing the name "doggy bag" in these communications. Such campaigns would also ideally provide information to consumers on the best health and safety practices for storing, reheating, and consuming the leftovers once home. In terms of the appeal that these campaigns should best make, our data indicate that "saving money" is likely to be the message that gains the most traction given the declared importance of this motivator. Demographic-based segments for whom this message is likely to be the most effective have been identified. Other appeals (save guilt, save hungry people, save the planet) are also likely to be effective as part of the campaign, although more research is required to better understand which appeals are most likely to best work with specific groups of individuals (Pearson & Perera, 2018). Another important area where public policy may contribute is through the funding of research on packaging design technologies, and consumer acceptance of these, for improved doggy bag containers that meet the consumer-defined requirements outlined in this research such as compartmentalized, no-spill, environmentally friendly, attractive, informative (recipes attached), etc. (Bozzola, Dal Palù, & De Giorgi, 2017, provide an overview of some innovative potentialities). Alternatively, some consumers could be encouraged to bring their own containers much in the way that they bring their own "keep cups" to the cafe, perhaps with a price discount offered, to help prevent container waste. Finally, at the policy level, regulatory bodies should make sure that the relevant legislation is conducive to creating an environment which permits consumers to take home any purchased food.

There are also a number of important managerial implications for the hospitality industry. Given that staff do not generally offer doggy bags in New

Zealand (only 25.1% of survey respondents who left food on their plates at their last dining experience were offered a bag) and given that few people ask for a bag (5.3%), it is vital that businesses encourage their staff to more proactively offer a doggy bag if there is uneaten food on a diner's plate. Prompts in the restaurant encouraging customers to take home uneaten food may also prove a useful tool. Alternatively, having the bags available and easily accessible for the customer to box it up themselves could be another viable option. Given the overwhelmingly positive attitudes toward doggy bags expressed by our samples, businesses that chose to engage in this practice may find they have a competitive advantage over those that do not. Allowing customers to be aware that they offer this service will forward doggy bag usage (focus group results indicated that only 37% of people knew if the restaurant gave doggy bags or not). Stickers on shop websites, windows, or on menus indicating the availability of this service would be useful. Given that motivators for using doggy bags are likely to differ depending on the businesses clientele, it will be key to understand the motivators of their clientele and tailor doggy bag containers, services, and promotions accordingly.

Based on focus group discussion around willingness to pay a surplus for doggy bag service, our research suggests that businesses should be wary of introducing an additional charge. The business case for offering doggy bags to customers may have to be made through the lens of improving customer service (see Seiter & Weger, 2014, for evidence that restaurants' diners paid bigger tips to staff who boxed their leftovers). Some participants did indicate that they would be willing to pay if the doggy bags met their expectations (i.e., they were biodegradable and of good quality) but further pricing strategy research is recommended.

There are a number of limitations of the current study. The demographic makeup of the focus groups (mainly young students) limits the generalizability of the qualitative results. Future research which explores in a more in-depth way the barriers and benefits of other older and higher income-earning groups of consumers is worthwhile. Just as there was a lack of diversity in age and income in the focus groups, the male voice was also underrepresented (37% of participants). Given that the survey data indicated some significant associations with gender (e.g., women were more likely to ask staff for a doggy bag), it would be useful to qualitatively explore the reasons why there are gendered differences and how best to overcome gender-specific-related barriers in more detail.

The research identified that different people are at different stages in terms of their adoption of doggy bag practices. Future research that better profiles the groups of consumers at each stage (particularly those that are "currently making no effort but have decided to start on it" or were "making no effort in doing this but are thinking about it" stages) would be useful in order to better understand what is needed to move people closer to adopting this behavior.

Given that offering doggy bags do represent a cost to restaurants, it is important that future research investigates these stakeholders' perspectives on the issue. This research will ideally understand the barriers and benefits from the businesses perspectives and how best to overcome these to ensure that doggy bags are a win-win solution for all concerned parties. Of course, other alternative measures for mitigating out-of-home food waste should not be forgotten. These may involve practices like choosing smaller portions (e.g., having a starter as a main dish, sharing with a friend, or choosing not to order sides), asking for more information about what will be on the plate (e.g., portion size, detailed description of food), ordering the next course once the diner has finished eating, etc. Examples of different strategies which could potentially be implemented to reduce food waste in a restaurant/café setting are being allowed to swap ingredients or sides the diner doesn't like for something else; being charged a flat price but allowed to change meal proportions to suit (e.g., larger salad, less fries); sides served, and paid for, separately; choice of smaller or larger portions for individual parts of meal; smaller portions of sides served initially with free top ups, etc. Initial work investigating consumers' attitudes toward menu alterations to reduce food waste indicates some promising avenues for mitigating food waste whilst dining out (see Doe & Mirosa, 2016) but much further work is required here given the scant academic literature on menu psychology in this area.

The study of consumers' doggy bag attitudes and behaviors is integral to the "out-of-home" plate food waste topic. According to the theories of community-based social marketing, future research is recommended to determine a specific practicable strategy to promote doggy bag usage, based on the information received from this study. An issue in the food waste reduction literature to date is a lack of experimental research to test the efficacy of behavioral change strategies (Porpino, 2016); so, research which identifies which doggy bag promotional strategies are likely to work better is required. Then piloting and evaluation of the strategy's effectiveness in selected restaurants and cafés is an obvious "next practicable step."

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